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EDITORIALS

THE CHEMIST

LIKE many other publications of scientific societies, THE CHEMIST finds its income reduced at this time. The Chemical Foundation has been most generous but is no longer able to continue its assistance to the same extent that it has in the past. THE CHEMIST has therefore been cut down to a size in keeping with the budget. The present issue contains 80 pages, which will be standard until the magazine can afford to expand.

During the past year the chief aim of THE CHEMIST has been to improve the quality of the material contained. It will now be necessary to put considerable effort on obtaining subscriptions and on increasing the advertising. A CHEMIST of the present size can pay all its expenses on a circulation of 6300, even if there are no new advertisers; and the Institute certainly ought to be able to present material of sufficient interest to warrant the spending of $2.00 a year by one-fifth of the chemists of the country.

We hope, of course, to go much further. The circulation of the *Journal of Chemical Education* is one and one-half times as great as 6300, although that journal is aimed at only one subdivision of the chemical group. A circulation of 15,000 would put THE CHEMIST in a position where it could afford to pay for articles involving needed research on professional problems.

THE CHEMIST cannot reach such a level without the cooperation of the members of the Institute—as regards articles, news items, new subscriptions, and even advertising (or especially advertising). The Institute is now supplied with the mechanism for expressing itself and for developing a magazine. Its success depends entirely on the membership.

The Institute

PERHAPS the reduction in the Institute's income is a blessing in disguise. The Institute came through the past year without a loss in membership, and is now in fine position to expand and become a more influential and more nearly all-inclusive organization. To carry out its aims, an increase in membership has been an obvious necessity for

a long time. Perhaps the reduced income, coming at a time of dawning improvement in general business conditions, may furnish a combined incentive and opportunity.

The membership committee, under the efficient leadership of Dr. D. D. Jackson, has already indicated that it will go far toward making up some of the glaring absences from the present roster. It cannot be stated too strongly that an immediate effort of this sort is essential to the vigorous carrying out of the Institute's aims—if not to the survival of the Institute itself.

Any organization which without any particular membership effort has held its own in the past year has an inherent vigor which promises future growth and strength, especially if all of the members cooperate with Dr. Jackson and his committee in every way they can.

An Unemployment Bureau

TWO weeks ago the *Herald Tribune* telephoned the office of THE CHEMIST and called attention to a $10,000-a-year chemical job advertised that day in the want ad columns by a commercial employment agency. The *Herald Tribune* had investigated the position and found it *bona fide*—not an attempt to get a high-priced man for an inferior position by publishing a salary higher than the company intended to pay.

We at once called up a Fellow of the Institute experienced in the particular narrow field required. He told us there were only five or six men in the country capable of filling the position and that these men were not likely to be reading want ads.

The whole situation seems particularly ridiculous—a chemical company resorting to a want ad in a daily newspaper to find a highly specialized chemist—so specialized, in fact, that the files of the Employment Bureau of The Chemists' Club listed no one capable of filling it. The incident points out again the great need for a chemical employment bureau which will list not only the unemployed chemists but all of the employed chemists of the country in a file by means of which a chemical employer can find the man he wants—whether that man is employed or not.

One of the objects of the Institute, according to the constitution, is to "Establish and maintain a register of its membership so that there will be a complete record of the training, experience, and fitness for service of each individual member." This list is now being prepared and is about half completed. When it has been finished and has been

made available for inspection by the chemical manufacturers, universities, and those who are looking for consultants, perhaps it will be the most helpful of the Institute's activities as regards each particular member.

Such a register, of all the chemists of the country, would be the most valuable contribution that could be made at the present time to the chemical profession—and incidentally to employers of chemists. We realize, of course, that a professional index of this sort would cost money—more money than The Chemists' Club or any other present agency can afford to spend. The united efforts of colleges, companies, and chemists could finance such a project, however—and at less than the cost of the present haphazard system of employment.

We are having prepared an outline for a bureau which might undertake such a task; and we hope that before long The American Institute of Chemists' register will point out its value.

Funds for Relief

THE return of the winter season coincides with the exhausting of the Breyer Committee's funds for relief of chemical unemployment and makes necessary an appeal at this time for more money to carry on the work of the committee. Last year many chemists, and particularly chemical industries, contributed heavily to relief funds which were not made available to chemists out of work—although the engineers, who were organized earlier, did succeed in getting some of this money.

Chemists are people as well as scientists and have a duty to the community as well as to their profession. Naturally they will want to contribute to general relief. It is to be hoped, however, that they will reserve part of their contribution for those in whose welfare they are more interested. Chemists ought to help other chemists if for no other reason than a selfish one. Every chemist out of work is a menace, if not to the actual position, to the salary and standing of every other chemist. Chemical consultants who cut prices to obtain business harm every other chemical consultant; and chemists who must work for anything they can get in order to avoid starvation lower the salaries of those who are regularly employed.

The Breyer Committee has a fine record of efficiency in administering the funds it has collected. Money contributed by chemists has been used for chemists instead of being given to people who ought to be taken care of by other agencies.

Part of the program this year will consist of visits to plants by the agents of the Breyer Committee. Chemical executives can help by contributing and also by making it easy for the committee's agents to approach the employee chemists—the men who ought to be more interested than anyone else in keeping the profession from demoralization.

Registered Chemists

THE first leaves of autumn have begun to fall, in the shape of the cards the bootleggers leave in our office. They are nicely gotten up this year, with pictures, some of them, and they are a great improvement over last year's crop. The bootleggers have adopted eagerly the Dollar Ideas described by Dr. Julius Klein over the radio a few nights ago. With all the competition, a bootlegger must be a keen salesman.

One sales device may be of interest to The American Institute of Chemists. Three of the cards that have come in within the past few weeks bear the line, "All merchandise analyzed and tested by registered chemists." Chemists registered where?

We quizzed several of the bootleggers and learned that the chemists were registered, oh, absolutely—but no further information could be given out. One bootlegger finally admitted that his chemist's report consisted entirely of the words "O. K." or else "Bad stuff." He promised to demand a statement showing percentages of di-ethyl phthalate, methanol, iso-propyl alcohol, aldehydes, ketones, etc., and to let us see the report. Thus far he has not done so. This same bootlegger also admitted that his whisky labeled "Aged twenty years" had not really been aged twenty years but had been subjected to a quick-aging process which had the same effect.

Still another bootlegger said he knew his merchandise was pure because his chemist charged five dollars an analysis.

We are far too cautious to express publicly any opinion on the right or wrong of the bootlegging business—in spite of Ralph Waldo Emerson's injunction to break the law. But we do want to point out that the expression "registered chemist" is put on the bootlegger's cards because it means something to the general public.

These cards indicate even more. By the very use of the words "registered chemist" they indicate that a considerable portion of the public believe chemists are registered now. How generally is it known that anyone at all can call himself a chemist? And just how hard would it be to get through the legislatures a bill to see that chemists receive some sanction before they offer their knowledge for sale?

Why Not Now?

By Leonard Wickenden

The need for an American Institute of Chemists. What has it accomplished?

I JOINED the Institute of Chemists in its early days for very definite reasons. For years I had experienced recurrent perturbation at finding myself a member of a profession which had no professional standing. When I told people I was a chemist, I found that they pictured me either behind a counter in a white coat selling ice-cream sodas and laxatives, or else as a somewhat superior factory-hand who stood all day stirring a mysterious concoction, evil in appearance and worse in odor. Some of the more enlightened, with innumerable pictures of chemists in their minds, even got as far as seeing me (again in a white coat) perpetually boiling liquids in a retort with a long, curved neck. But all alike found in my profession something faintly comical and quite pitiable. Had I, in my wrath, told them that in the business world a chemist is equal in importance to a corporation lawyer, and that in the scientific world his value to humanity is on a par with that of a doctor or a surgeon, they would have smiled politely and found me more pitiable than ever.

That was bad enough; but far worse was the discovery that the world was full of men who called themselves chemists and who were just as comical and just as pitiable as my friends found me. A "chemist" would write to me for a job and tell me that although he had never been to "colledge" his "labratory" experience had covered a wide "feild." A factory "chemist," on being asked for some sodium carbonate, would tell me that he hadn't an ounce in the place—all he had was soda ash. A research "chemist" would persuade my friends to invest in a wonderful

discovery by which lead could be converted to gold, with diamonds as a by-product. And the right of these ignorant or dishonest men to call themselves chemists was, under the law, as good as mine.

If a street-cleaner made a physic of dried snails and dandelion leaves and set up in practice as a doctor, he would soon find himself behind bars. If a truck-driver hung a sign outside his house calling himself a lawyer, the sign would not hang there very long. But anyone who knew that the formula for water was H_2O could call himself a chemist, and no one could say him nay. In fact, I once met a follower of my chosen profession who invariably referred to water as HO_2.

DISTRESSING as all this was, there was nothing I could do about it. There was, it seemed, nothing that the American Chemical Society or the Society of Chemical Industry could do about it. At all events, they did nothing. And then the American Institute of Chemists came along and said, very emphatically, that it *was* going to do something about it. In the "Foreword" to (I believe) the first published list of officers and members, there were strong words:

> The American Institute of Chemists . . . exists to advance the profession of chemistry in America . . . to establish means of differentiating between those who are adequately trained . . . and those who profess to be chemists but who, in reality, are untrained and incompetent. It is a function of the Institute to say who is a chemist. The Institute proposes to establish and maintain a standard of proficiency . . . by enforcing standards of professional conduct . . . by doing everything possible to enhance the prestige and distinction of the profession of chemistry. The Institute will also seek to improve the economic status of the profession of chemistry.

There was more of it, and it was all good. I read it to myself with joy and gave a hearty round of applause at the end of each eloquent paragraph. Bang went five dollars (I think that was what we paid in the good old days), and I was duly elected a Fellow of the American Institute of Chemists.

By consulting the records, I see that the date of that auspicious event was March 14, 1923—nearly ten years ago. In those ten years has the Institute lived up to its party platform? Perhaps that is a tactless question—as tactless as one addressed by the wife of an English friend of mine to a man named John. At the time my friend and his bride left England in 1912, Nancy, the pretty housemaid at the bride's home, was "walking out" with a farm laborer from a neighboring village; and (perhaps because of a fellow feeling) my friend's wife took an especial inter-

est in Nancy and her John. For one reason and another, my friends did not re-visit England until 1927. One day they drove over to the village, and whom should they see walking down the street but their old friend John. They were a little surprised and shocked to see how much older he had grown in the intervening fifteen years, when they themselves felt as young as ever; but after shaking hands with the blushing, smiling John the wife asked: "And how's Nancy, John? I suppose you have a big family of children by now?"

John coughed, a little embarrassed. "No, ma'am," he answered, "we ain't married yet, but we're gettin' ready."

The Institute, too, it seems, has been getting ready. At all events, if "it is the function of the Institute to say who is a chemist," it is apparent that a great many other organizations and individuals continue to claim the right to share that function; and if there is any increase in respect for the profession on the part of the public, that increase is not so great as to be easily noticeable.

FAR be it from me to assume the easy but contemptible rôle of arm-chair critic. If the Institute during the last ten years has achieved little in the direction of raising the status of my profession, I am only too painfully aware that I, personally, have done less. I can only offer, in extenuation, that my disability due to deafness makes me of little value in group work, for a deaf man at any kind of public meeting is a misery to himself and a nuisance to everyone else. Indeed, that same disability really disqualifies me from even suggesting that achievement has, so far, been small, for I am not closely enough in touch with the work of the Institute to know whether it has done much or little. When, however, the editor of THE CHEMIST was kind enough to invite me to write an article, I wondered if I might express on paper some of my misgivings—the greatest of which is that before our profession takes its rightful place in this world, I, as an individual, shall have taken my rightful place in another and, as we all hope, better world.

If I seem to take on more and more the aspect of critic, it is in spite of my personal desires rather than because of them. Any suggestions that I make are put forward with the utmost diffidence and with a full appreciation of the enormous difficulty of the problem which the Institute set itself so courageously to solve. Referring, however, to that first *List of Members* from which I have already quoted, I find a brief but interesting statement regarding licensing. After pointing out that there are no statutes or regulations pertaining to the practice of chemistry, the statement goes on to say: "Whether it would be desirable to take steps

immediately toward the placement of statutes pertaining to the work of the chemist, is deemed to be still an open and moot question." A good deal of water has flowed under Brooklyn Bridge since those words were written, and I am wondering if the question is still considered open and moot. Apparently it is, for the conclusions reached by the licensing committee as given in their report published in THE CHEMIST for March, 1931, are surprisingly (and to me depressingly) similar to those reached by the writer of the paragraph referred to above. To quote first from the report made in 1925:

> It is believed that the question should be given very careful consideration by the members of the Institute, not merely alone, but also in conjunction with chemists who are not, at this moment, members of the Institute, but whose opinions may prove of very considerable value.

And now from the report of 1931:

> The Committee therefore advises that the members of the Institute, as individuals, should intelligently and without prejudice consider and discuss the license question among themselves at section meetings and among other chemists and professional men.

If, after discussing it for six years, the only conclusion we reach is that we are quite safe in going on discussing it, what hope have we that the report of 1941, or 1951, or 2051 will reach any different conclusion?

WHEN I first read the report of 1925, I experienced some surprise tinged with dismay. It is difficult for me to understand the attitude of mind of a chemist who has to be *converted* to the support of a movement which has for its object the legal defining and protecting of the members of his calling. If we look to the state to see that we get what we ask for when we employ a doctor, or a lawyer, or a nurse, or a pharmacist, how can we chemists do otherwise than insist that the state give the public and ourselves the same protection? If we cannot obtain for ourselves legal recognition as a skilled and specialized profession, how can we hope that the public will, of their own volition, grant us that recognition?

These questions are not entirely rhetorical. There may be—there must be—arguments on the other side which have not reached my dull ears; and I am hoping for an expression of them in THE CHEMIST. The only argument against licensing that I recall having heard is that it would put us in the same class as dogs. One would look for an expression of that kind from Mrs. de Puyster van Rensselaer's Ladies' Knitting Guild.

but to find it coming from even a minority of an organization which is supposed to be made up of those who, by training and instinct, are accustomed to clear thinking, is indeed depressing.

Even if this were true, I fail to see the objection. "The more I see of some chemists, the better I like my dog." But of course it is not true. It is not the dog who is licensed to have an owner; it is the owner who is licensed to have a dog—just as he is licensed to drive or own a car or to go fishing or hunting. Presumably the proud souls who scorn licensing on such grounds also loftily refuse to be car owners or to handle a fishing rod or a gun. If it is a matter of any importance what kind of bed-fellows licensing would give us, it is obvious that it would put us in the same class as doctors and lawyers.

ANOTHER sentence in that admirable "Foreword" reads: "The Institute will also seek to improve the economic status of the profession—by cooperating with employers of chemists." In 1925, the Institute had not included in its Constitution this statement about cooperating with employers. Today, however, the phrase is in the Constitution and it has been strengthened by the addition of the words: "to secure a satisfactory appreciation and evaluation of the services of a chemist."

I have done some furious thinking over that clause in recent months. I happen to be in the position (probably not uncommon among my fellow members) of being at the same time an employee and an employer. As an employee, I can picture to myself with a certain wicked glee a deputation from the Institute calling upon the directors of my company and cooperating with them by suggesting an upward revision of their evaluation of my services; but if the same deputation showed a desire to cooperate with me by telling me that I was underpaying my subordinates I doubt if I should display much glee, although the wickedness might remain. I perceive that the business of making effective Clause 6 of Section 2 of Article 1 of our Constitution must be a matter of some delicacy. I think it would be of enormous interest to learn to what extent and with what measure of success the Institute has, in the past ten years, secured a satisfactory evaluation of the services of chemists by cooperating with employers.

Before we can begin to make the clause effective, it seems to me that we must obtain legal recognition. Unless we, like the lawyers and doctors, can bring into existence our "closed shop" we must remain in the same position as any other unorganized workers, offering our services in competition with those who will accept any remuneration rather than starve and who will countenance any unethical practice as long as it is

profitable. Until we can go to employers and say, "Unless your chemist is licensed by the State (or better still, unless your chemist is a Fellow or Associate of the Institute) he is not really a chemist at all," there must always be pseudo-chemists whose competition will lower both the general scale of remuneration and the standing of our profession in the community. Once obtain State or Federal recognition, and a campaign of education among employers would be rendered not only intelligent but hopeful of results.

This question of legal recognition of our profession is, I feel, so fundamental that, unless the governing body of our Institute can conscientiously adopt a more optimistic attitude toward it and unless the organization as a whole can take some more positive action in promoting it, the existence of The American Institute of Chemists can scarcely be justified. Lacking public recognition, all talk of professional ethics, of improved economic status, of enhanced prestige, is, it seems to me, just talk and nothing more; beautiful but empty phrases; soft words that butter no parsnips. Without that recognition, or without an unceasing and determined fight to obtain it, our organization takes its place as a small brother to the American Chemical Society or the Society of Chemical Industry—and perhaps an unwanted small brother at that.

THIS leads me to my final suggestion. If I have been reluctant to express my views in the earlier part of this article, I am more so than ever, now. This final criticism (if criticism it can be called) must appear especially ungracious, because it concerns THE CHEMIST itself. I have been impressed in recent months by the improved appearance and increased bulk of THE CHEMIST, but I have not been without misgivings regarding its contents. I have noticed a steady increase in the number of articles of a descriptive nature, covering this or that industry or institution. The articles in themselves have been excellent, but are we, by their publication, furthering the particular purposes for which the Institute was organized? With the journals of the various scientific societies, supplemented by those published under private enterprise, there is ample outlet for articles of such a nature; and their output has already reached such proportions that few of us can find time to read more than a fraction of them. If the money is available for their publication, would it not be better spent, *from our point of view*, in educating our fellow chemists and the public regarding the need for establishing definite standards for our profession?

As I see it, the American Chemical Society and the Society of Chemical Industry are well able to take care of the technical side of our pro-

fession. The Chemists' Club can take care of the social side. It is for the Institute to concern itself with business and professional aspects. If members of the Institute, as a whole, are not sufficiently alive to the importance of these aspects to keep our magazine supplied with enough material to fill it, then, I would say, let us go back to our smaller publication and spend the money on propaganda, first among the members of our own profession and, second, among the general public.

Perhaps the fight is a hopeless one. Perhaps there is something about the psychology of the chemist which makes him different from a doctor or a lawyer and unable to combine with his fellows for their mutual advantage. Perhaps he is, and always will be, too proud to fight. But it seems to me better to find these things out once and for all than to side-track them and decline into another polite but rather futile organization which confers upon its members the privilege of talking as much as they please when the other man is supposed to be listening and of listening as little as they please when the other man is talking.

Censoring Foods and Drugs

P. B. Dunbar

How government chemists keep our drugs pure and our foods fit to eat. Opportunities for the young graduate in the Food and Drug Administration.

THE Food and Drug Administration came into existence as a bureau of the Department of Agriculture on July 1, 1927, by virtue of an act of Congress. It was created to enforce a number of regulatory measures, the principal one being the Food and Drugs Act, which from 1907, the date it became operative, had been administered by the Bureau of Chemistry. The law-enforcing machinery and personnel of that bureau were at once transferred to the new organization.

The administration is now charged with the enforcement of the Food and Drugs Act, the Insecticide Act, the Tea Act, the Naval Stores Act, the Caustic Poison Act, and the Import Milk Act. It has a personnel of approximately 593, including 159 chemists, 78 food and drug inspectors, and 50 other specialists: bacteriologists, microanalysts, medical officers, and the like.

The laws enforced by the present organization are far-flung in scope. They include interstate, import, and export traffic in a wide variety of essential commodities. To insure the most effective action, the forces of the Administration are distributed throughout the United States in three inspection districts: Eastern, Central, and Western, with headquarters at New York, Chicago, and San Francisco, respectively. The Eastern District includes, roughly, the Atlantic Coast states and the island of Porto Rico; the Central District embraces the Mississippi Valley states; while the Western District comprises the Rocky Mountain and Pacific Coast states and the territory of Alaska.

The districts are further subdivided along advantageous geographical lines into what are known as field-station territories, which usually include two or more states, in whole or in part. Enforcement headquarters are established in the most convenient city and headed by a competent administrative officer as chief. Each station is furnished with suitable laboratory equipment for the analysis of foods, drugs, insecticides, and other commodities subject to the laws administered, and is manned by the proper complement of chemists, inspectors, and clerks.

Statutes the Administration Enforces

To present clearly the opportunities for a chemist in the Food and Drug Administration, it is necessary to outline briefly the requirements of the various statutes enforced. Most important is the Food and Drugs Act, enacted by Congress on June 30, 1906. This act prohibits the adulteration or misbranding of foods and drugs shipped in interstate commerce or manufactured, sold, or offered for sale in the territories or the District of Columbia, or imported into, or exported from the United States. The definition of food, as given in the statute, is sufficiently broad to cover all foods, beverages, confectionery, condiments, and waters used by man, as well as animal feeds. Likewise, the statutory definition of drugs covers all medicines intended for the cure, mitigation, or prevention of disease in man and animals.

Next in importance is the Insecticide Act of April 26, 1910, which prohibits the adulteration or misbranding of insecticides and fungicides. Its jurisdiction is practically identical with that of the Food and Drugs Act.

The Tea Act of March 2, 1897, is designed to guarantee the quality of all imported tea. The Naval Stores Act of March 3, 1923, prohibits the misbranding or adulteration of rosin and turpentine. The Caustic Poison Act of March 4, 1927, requires that the labels of certain specified poisonous substances bear the word "poison," a statement of the antidote, and other prescribed information. The Import Milk Act of February 15, 1927, insures the purity of imported milk and cream.

Determining the quality of teas is a task for expert tea tasters, a number of whom are employed by the Administration. Control of imported milk and cream is largely bacteriological. The greater part of the chemical work of the Food and Drug Administration, therefore, is in the examination of foods, drugs, insecticides, and fungicides, though a small amount is required in the analysis of turpentine and of various caustic poisons.

This chemical work is intensely practical. Chemistry in the broadest sense, effectively aided by microscopy and bacteriology, is the foundation on which the enforcement work is based. The chemist's course is, for the most part, an uncharted one. Methods for the detection of adulteration and for proving such adulteration under the rules of court evidence must usually be worked out for each individual case of law violation.

GRADING PEAS BY TASTE. MRS. HARVEY W. WILEY IN FOREGROUND

When the statutes now enforced by the Food and Drug Administration were first enacted, the textbooks on food and drug analysis applicable to American products were few in number, limited in scope, and scant in authentic data. The literature contained many untried and faulty methods. In more recent years, however, there has been built up through the efforts of state and federal officials—especially through the operations of the Association of Official Agricultural Chemists—a compilation of analytical methods of great merit. But notwithstanding the value of these methods for the routine analysis of foods, drugs, and insecticides, changes in manufacturing processes and the development of more modern scientific theories concerning adulteration constantly present new and puzzling problems for the chemist to solve.

The annual report of the Department of Farms and Markets of the State of New York, for 1926, page 71, aptly describes the field of the food control chemists:

> In making the necessary examinations for detecting adulterated and misbranded food the work of the laboratory articulates closely with the inspectional work on the one hand and the machinery of law enforcement on the other. While it is true that the grosser forms of adulteration and misbranding are disappearing, it is equally true that modern commercial enterprise is constantly seeking to introduce new foods and food preparations and new combinations of foods, and in some cases to incorporate into foods new synthetics and other non-foods of dubious physiological effect.
>
> In these days of high-pressure salesmanship and keen competition,

> the food manufacturer, however high his ethical standards, cannot be humanly expected always to protect the consumer from deception on the one hand and the rival manufacturer from unfair competition on the other.
>
> This is the legitimate province of the food control official, and he was never more needed than today. It is one thing to detect such gross and obsolete forms of adulteration as lamp black in black pepper and talcum powder in confectionery, and quite another to cope with the subtleties of present-day food sophistication.

At present, appointments in all federal departments are reduced to a minimum. Under ordinary conditions, however, appointments in the Food and Drug Administration are made in the grade of junior chemist at an initial salary of $2000 a year. Positions are open to those who have qualified under civil-service rules and who have received as a prerequisite an undergraduate degree from a recognized college or university giving courses in chemistry. Openings in higher grades at larger salaries are available on occasion to chemists having postgraduate or commercial experience. After appointment, a six months' probationary period is required in accordance with established civil-service rules. If at the end of this period the appointee has shown fitness for the place, his appointment is made permanent. If, however, his services have not been satisfactory, he cannot expect to be retained in the Food and Drug Administration.

Many Kinds of Ability Needed

Having demonstrated his eligibility for permanent appointment, a chemist may advance along any particular line for which he displays special ability. His aptitude may be for analytical work, in which event he is likely to be assigned permanently to one of the field stations of the Administration, where he will be called upon to analyze a large variety of products, including foods, drugs, insecticides, and caustic poisons. Should he show marked skill in any one of these fields he is likely to be detailed almost exclusively to the examination of the class of products for which his qualifications especially fit him. In such an event he may expect an extremely wide variety of analytical work.

The young chemist may show interest and proficiency in research. To such men opportunities are not lacking. As has already been indicated, new problems in food, drug, and insecticide fields are continually arising. New methods of analysis must be developed. New forms of adulteration must be detected and checked. Chemists with an urge for research will find this work an enticing activity.

The young specialist may have the kind of roving curiosity which

would qualify him to serve better as a food and drug inspector than as a distinctly laboratory man. At the present time, the Administration appoints as food and drug inspectors only men who have received a bachelor's degree in science. Given the benefit of technical training, such men make most capable inspectors. They understand the technical processes carried on in the manufacturing plants they inspect.

Finally, the chemist may show decided administrative ability. In this event, there are frequent openings for him in administrative positions. Practically all of the executive positions in the Administration are now filled by men who have come up from the ranks and whose initial services were as inspectors or chemists. Transfers from one line of activity to another are freely made as the needs of the service demand and the abilities of the chemist warrant.

Some Specific Problems

A few illustrations will show the variety of problems constantly presented. The Food and Drugs Act prohibits the shipment of foods which are filthy, decomposed, or putrid, or which contain added deleterious ingredients which may render them injurious to health, or which have been debased in some fashion so as to lower their economic value without appropriate label declaration showing such debasement. An inspector locates and samples a shipment of canned fish. Organoleptic evidence leads him to suspect that the fish were in an advanced stage of decay at the time they were canned. To permit the distribution of such a product to American consumers would be an offense against decency, yet the processing of the canned article has removed most of the tangible, organoleptic evidence of decomposition. It is the chemist's problem to develop, by appropriate research, analytical methods that will establish the fact that unfit and decomposed fish were actually canned.

A grower of fruits or vegetables knows that an excess of lead arsenate spray residue on his products is toxic and therefore constitutes a law violation. He resorts to a fluoride spray, thinking that the residues will be less objectionable than those of lead arsenate. Unfortunately this grower has merely exchanged one poison for another. The food chemist's first duty is to determine (if necessary through feeding experiment) carried on in the pharmacological laboratory of the Administrations whether fluorides are to be regarded as toxic, and he must check his conclusions by reference to the literature. If toxicity is established it then remains to determine by what amount spray residues must be reduced in order that the food as it reaches the consumer may be absolutely safe. The further problem is presented of working out a reliable quanti-

tative method for the detection and estimation of minute quantities of added fluorides in fruits and vegetables. That question is under study in the Food and Drug Administration today.

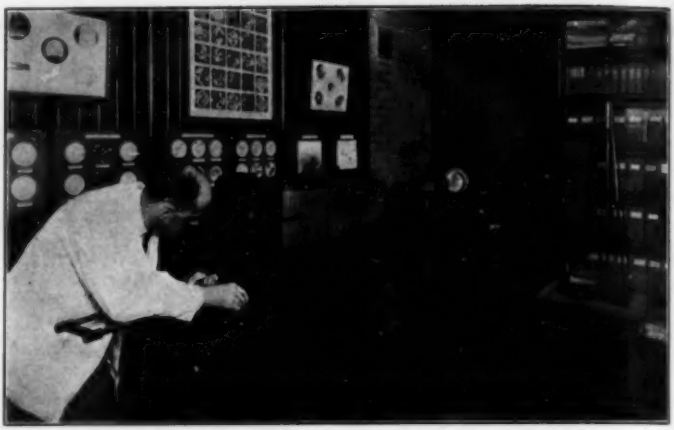
Fruit jellies and preserves are found to be subject to a new type of debasement through the substitution of fruit pectin for the usual fruit ingredient. Fruit pectin is a harmless substance and, under some conditions, has legitimate uses. Its use to reduce the quality of a jelly or preserve sold as a pure fruit product is distinctly illegal. A complication arises from the fact that genuine, standard fruit preserves naturally contain fruit pectin. How is the preserve which contains an excessive amount of fruit pectin to be identified and distinguished from that which contains the legitimate natural amount? The chemists of the Administration have answered this question, and the answer has meant not merely the protection of the consumer but likewise the elimination of unfair competition suffered by manufacturers of legitimate products.

TESTING TOMATO COLORS

Dealing with Patent Medicines

A drug analyst is assigned a patent medicine of wholly undetermined composition, which is offered the public for the cure or mitigation of all ailments. His simple little task is to determine the composition of the article—to learn what its medicinal or alleged medicinal ingredients are—so that the physician, by consideration of the formula, may judge to what extent the manufacturer has made exaggerated and deceptive therapeutic claims.

A nation-wide outbreak of paralysis is traced to the so-called "ginger jake," a bootleg preparation which is merely an imitation of the tincture of ginger recognized in the United States Pharmacopoeia, but so modified by the addition of non-pungent ingredients as to render its use possible as an alcoholic beverage. The article is subject to the prohibition laws. Its illicit distribution is a distinct violation of the prohibition act and is so recognized by the regulations of the Prohibition Bureau. The epi-



THE EXTENSION RODS ON THIS MICROGRAPHY APPARATUS WERE INVENTED IN THE BUREAU

demic, however, attracts the attention of all governmental agencies to this product, and it is the chemists' duty to determine what ingredient is responsible for the paralysis. Chemists of the Food and Drug Administration, of the Prohibition Bureau, the Public Health Service, and independent workers throughout the country immediately begin an intensive search. Legal action must be withheld pending the identification of the poisonous agent. This time, a chemist in a bureau other than the Food and Drug Administration identifies the poison as tricresyl phosphate, a substance ordinarily employed as a plasticizer in lacquer, never before heard of in an alcoholic beverage and never before known to be poisonous.

These illustrations briefly indicate the wide fields of investigation in foods and drugs alone open to analysts, inspectors, and research workers in the Food and Drug Administration.

Problems no less varied and knotty arise in the insecticide and fungicide work. The newly enacted Caustic Poison Act presents some analytical puzzles of peculiar interest and difficulty. The urge of new discovery, the excitement of following the trail of the adulterator, the appeal of the work to those who have a public service instinct, the diversity of the problems daily encountered, all of these things make a composite of such absorbing interest that it has sufficed to enlist and hold in the regulatory service men of high ability and training who have deliberately chosen to make this work a career. It is because of the vigilance and earnestness of these men and their coworkers in the in-

spection and administrative fields that the American consumer today is assured better and purer foods and drugs, and more effective insecticides than probably are available in any other country on the face of the globe.

Camp and Campus

ONE of the most interesting and significant experiments in vocational guidance and college selection is being carried on under the auspices of Stevens Institute in a camp fifty miles from its campus. It is called a "college camp," but the campers are preparatory schoolboys. While enjoying the advantages of outdoor life they are getting the benefit of expert advice. Many young men do not have it until they have made their vocational decisions or chosen one type of college instead of another.

Aptitude tests are given to determine whether a young man is better fitted for the arts college and "should not be diverted therefrom by the trend of the day toward science and engineering." What this really amounts to is discovering whether the boys show special aptitudes for one or another applied science, especially engineering. Field work in surveying is conducted under trained engineers, and the major divisions of modern engineering are described by distinguished visiting lecturers, each an authority in his field. One liberal arts college president gives general advice on choosing a college.

This sort of camp is an ideal plan for detecting young men of promise in science and engineering, or for turning toward other fields those who show no scientific or mechanical capacity. It would be more difficult to equip selective camps for the discovery of boys who would have greater benefit from the training of the liberal arts college. Yet association in camps through which men could come to know more intimately the qualities of youth would be a substitute in part at least for written college entrance examinations. If more such camps could be maintained the campuses would not be cumbered with so many uneducable or ill-adjusted students. The camp in the open is coming to be more and more a place of education as well as recreation.

In this particular camp the graduates of twenty colleges of engineering will later gather to discuss the general theme of "Money and Banking." Thus it serves both as a pre-campus and a post-campus institution, and gives new meaning to Horace's line: "Multos castra juvant."—Editorial in *The New York Times*.

Specialized Graduate Study

A graduate school that concentrates on a single industry. Building up the Institute of Paper Chemistry.

A NEW building honoring J. A. Kimberly has just been presented by his son, J. C. Kimberly, to the Institute of Paper Chemistry, graduate school of Lawrence College, Appleton, Wisconsin. The building, a library and laboratory, built at a cost of more than $100,000, is the second unit of the institute, a $250,000 unit having been dedicated just a year ago.

Dr. John H. Finley, associate editor of *The New York Times*, was the principal speaker at the event last year, which drew the praise of President Hoover and of industrialists throughout the country as a significant event in American education.

The institute, supported by more than 250 mills and corporations, has thirty-five selected students, fifteen of whom were admitted this year from a list of more than 200 applicants.

In accepting the new building, Ernest Mahler, vice-president of the Kimberly-Clark Company and president of the institute's board of trustees, referred to J. A. Kimberly as one of the greatest pioneers of the paper industry. He paid tribute to the son as "one whose courage and far-seeing ideals have made possible the continued rapid advance of this educational program during one of the world's greatest economic crises."

In describing the institute, Mr. Mahler continued:

"Our purpose is to develop a graduate school centered around one coherent purpose. There has been a strong tendency in recent years for graduate schools to become so big that they are almost unmanageable; and the minds of the staff and students are distracted by the multitude of diverse aims and objectives.

"It is our conviction that there is a unique place in American education and American industry for a small, perfectly equipped, and thoroughly organized graduate school, where every individual, whether trustee, staff member, or student, is thinking in common terms about a great industry."

Prospects in Paper*

By R. H. Stevens

The need for chemists in the fifth largest industry of the United States. Present research programs. The future of the paper chemist.

LAST December there appeared in THE CHEMIST an article by Dr. D. P. Morgan, with the title, "Economic Research for the Chemist." The author emphasizes the inadequate return often realized by chemists on their investment of time and money in gaining an education.

"It is our belief," he says, "that in many cases the distressing results are needless. A proper evaluation of the risks involved, based on a business-like study of the economic situation, would probably have indicated that the chance of a satisfactory return on the chemist's investment was disproportionately small in view of the hazards to be encountered."

Dr. Morgan cites the low-temperature carbonization of coal as a field in which failure to market by-products brought economic disaster. The chemists who had done the research lost out. "No careful investor," Dr. Morgan points out, "would consider putting more than a very small portion of his funds into any one speculative proposition. Consequently he would not be embarrassed by a 100% loss."

Admitting the truth of this criticism, the fact remains that the average student of chemistry lacks the information on which to base an estimate of the probable yield on his investment, even if he were capable of judging wisely. All too often he is compelled to grab the first opening he can find, and this opportunism may lead up a blind alley.

In order to aid the student of chemistry in making an intelligent investment, THE CHEMIST is arranging a series of economic surveys of various industries in which chemists are employed. It is hoped that such surveys will bring out useful information regarding the more important factors that determine the success or failure of chemical enterprises. I have been asked to do this for the paper industry. Thus far

* A preliminary paper presented before the Louisiana Section, American Chemical Society, Bogalusa, La., May 21, 1932.

I have not been able to gather many economic data, but I am going to present some thoughts on the subject in the hope that discussion will lead to constructive suggestions.

At present one is likely to obtain a gloomy picture of the prospects for the chemist in the paper industry. The world-wide economic situation has forced wholesale retrenchment. All too often the chemist was one of the first to be laid off; and once off the pay-roll there seemed to be no getting on again. Almost every day I receive at least one application from some chemist thrown out of work; and soon there will be new graduates seeking a return on their educational investment. Since the paper industry is our fifth largest manufacturing industry, however, and is essentially a chemical engineering industry, there is bound to be some place in it for the chemically trained individual.

IN THE past fifteen years there has been a marked change in the attitude of the paper industry toward the chemist. From open hostility, for which the chemist himself was often largely to blame, the attitude has changed to one of friendly welcome. In most paper mills the chemist is now an integral part of the organization, and is consulted on all problems on which his training and experience have fitted him to render an expert opinion. Though perhaps not actually in charge of operations, the chemist is certainly charged with the duty of cooperation; and the more successful he is in this respect, the more efficient he is in accomplishing his objectives.

Some of the larger and more progressive companies maintain a research department to develop new products, to investigate complaints, to discover competitors' secrets, etc. One New England mill employs nearly a hundred chemists and has developed a large number of new products and by-products. Another mill in the South with a smaller staff has had marked success with a similar program. Still other paper companies maintain research fellowships at Mellon Institute, at the state universities, or in other scientific institutions. Three years ago the American Paper and Pulp Association and the Technical Association of the Pulp and Paper Industry established a research fellowship at the Forest Products Laboratory in Madison, Wisconsin. The latter has already developed information of fundamental value on the properties of pulp fibers and their effect on the structure of a sheet of paper.

THE growing recognition of the need of chemists in the paper industry has been strikingly demonstrated recently by the founding

of an Institute of Paper Chemistry at the insistence of (and largely financed by) paper mill executives, who saw the need for chemists specially trained to work on problems of the industry. This is strictly a graduate school giving a four-year course. Though it opened only two and one-half years ago in temporary quarters, it has already conferred the degree of Master of Science on ten students. At present there are twenty-two men enrolled, of whom eight are candidates for the doctor's degree. Last fall the Institute dedicated a fine new building completely equipped for instruction and research in the various phases of the application of chemistry to paper manufacture. A new library building is now under construction and should be completed in time for the opening of the next school year.

In addition to this Institute there are two undergraduate schools of paper-making: the University of Maine and the New York State College of Forestry. Though the graduates of these schools may not be rated as chemists, chemistry is the backbone of the course of study. Many of the graduates pursue advanced studies in chemistry before finding a place in the industry. Just across the international boundary, in Montreal, is The Paper Institute of Canada, at McGill University. It was established jointly by the Canadian Pulp and Paper Association, the Forest Products Laboratory of Canada, and McGill University, and its research in cellulose and paper chemistry is being crowned with brilliant success.

Still further recognition of the importance of chemistry in the manufacture of paper was the publication a few years ago of a series of textbooks on paper manufacture, prepared under the direction of a joint committee representing the Technical Association of the Pulp and Paper Industry (United States) and the Technical Section of the Canadian Pulp and Paper Association. Though only one of the six volumes is devoted to chemistry in the narrowest sense, the whole series forms a necessary part of the library of every paper mill chemist. I believe the paper industry is unique in having thus voluntarily prepared under its own direction a standard set of vocational textbooks designed for the men in the mill.

Such recognition by the industry ought to convince any one that there is, and always will be, a place for the chemist in the paper mill. According to information obtained through trade association channels, the paper mills and allied manufacturing plants in the United States employ approximately 1500 chemists, or roughly 8% of the total in the country. The salaries paid these men vary from $100 a month up to $400 or $500, with probably a few exceptional cases both below and

above these limits.* The more successful men soon graduate from the laboratory into the mill and become foremen, department superintendents, or salesmen; and their earnings increase correspondingly.

THE prudent investor always scrutinizes carefully the stability of any enterprise into which he contemplates placing his money. To the chemist seeking a return on his education the stability of the industry he enters is of prime importance. The paper industry, as a whole, has one very strong element of stability. This is the heavy capital investment required. Fifteen years ago, when I was considering taking my first job in a paper mill, I asked an acquaintance, who was a paper jobber, about the solvency of the mill company. He replied, "Any one with money enough to get into the manufacture of paper ought to be a safe bet." The capital investment required for the manufacture of paper is so great that the mill must operate continuously in order to remain solvent. In the order of magnitude, fixed charges on capital come ahead of labor in the manufacturing cost. Only raw material and power exceed the capital charges; and in some of the Southern mills having cheap wood and power these may cost less than the investment.

On the other hand, the rapid expansion of the industry in the past decade, especially in the South, has brought about a condition of unrestricted competition that is fraught with danger. This highly competitive situation, however, accentuates the need for the chemist, who can effect new economies and discover new products or new uses for old products.

As for the future, I can best close by quoting Prof. Stewart J. Lloyd, F.A.I.C., of the University of Alabama. He predicts that the development of cellulose chemistry in the next twenty-five years will duplicate that of the power industry in the past quarter-century, particularly in the South. "Twenty-five years ago," he said, "the power companies were small and scattered. Any competent young engineer who got in with one of those companies then and held on rose by seniority through the consolidation stage to a good executive position. The same thing will happen in the cellulose field. Competent young chemists and chemical engineers who get into the game now and make good will rise by seniority, as the industries develop, into good positions when they attain middle age."

* A questionnaire circulated among the members of The American Institute of Chemists several years ago disclosed one paper-mill chemist with an income (salary and bonus) of $1000 a month.

A Chemist Looks at Alcohol Control

By C. A. Nowak

The need for trained chemists in government plant supervision. Wood alcohol in home-made wines and artificially aged spirits.

IT MAY never have occurred to the readers of THE CHEMIST that the unprecedented newspaper publicity given the Eighteenth Amendment has practically ignored the chemist, the person most vitally affected by present-day conditions of law enforcement.

A timely editorial in the April issue of THE CHEMIST raised the question of the effect of prohibition upon the chemists employed by the many industries in which alcohol, in one form or another, is essential. Also to be considered are the industrial alcohol plants and the breweries which produce cereal beverages by fermentation and then remove the alcohol by vacuum distillation.

My own close connection with the fermentation industry has given me ample opportunity to observe conditions; and the fact that I have kept my record clean and have always operated strictly within the law enables me to speak frankly of the evils which threaten every industry engaged in the manufacture or use of alcohol. (As another consequence of my attitude, my savings, the result of over twenty years of service in the brewing industry, have gradually dwindled away.)

Quoting from the editorial just mentioned, the following statement perhaps needs no amplification: "The effect on the individual alcohol chemist has been to give him only two choices, neither very enviable: he can take part in an illegal enterprise, or he can work for a firm that is almost certain to lose money."

I have never envied the friends who worked beside me in the laboratory during my early post-school days and who have since become affluent. I have had similar opportunities, of which I did not take advantage simply because they did not interest me. The acquisition of wealth carries with it a certain risk; and some individuals lack the necessary spirit of adventure. Sometimes I wonder, however, whether strict adherence to the letter of the law is profitable. The corruption in certain forms of administration has extended into legitimate industries and professions, until successful operation in some industries makes submission to the typically American system of "racketeering" a necessity.

A FEW years ago I spent a short time in Washington in the Bureau of Plant Control, Division of Industrial Alcohol, trying to bring about a better understanding between industry and government. I was especially engaged in developing a more satisfactory form for reporting brewery plant operations. It was my opinion that by making these reports more exacting government control would work less hardship upon the brewer—who, whether honest or not, is regarded with suspicion by the average government inspector.

My association with the government was of short duration, largely because I could not be part of a political system which persecutes the innocent as well as the guilty, any more than I was willing to participate in the deliberate violation of our existing prohibition laws.

Let me give a concrete example: As a fermentation chemist of experience and recognized standing, I consider myself qualified to define the nature and uses of raw materials used in the art of brewing. Personally, I see no difference, except for water content, between a hopped malt wort containing 88% of water and the same hopped malt wort containing only 20% of water. In my laboratory experiments I have substituted one for the other (making allowance for moisture content) and have obtained practically identical results. Yet the sale of the dilute wort is illegal, even if the amount of total solids present is declared on the label and the products are of equal purity.

SUCH needless rules are a hindrance to sensible alcohol control; but much more serious is the fact that the men who inspect plants in the fermentation industries lack general chemical education and understand practically nothing about the industries with whose control they are entrusted. Unemployment among highly trained chemists today would be alleviated if experienced men were installed in positions

where they are badly needed to establish sane government supervision. This work not only requires trained men, but it requires men whose background guarantees their honesty and their devotion to the profession of chemistry. Such men can be found among the Fellows of The American Institute of Chemists and in other professional organizations of equally high standing.

It is unfortunate that a great many able chemists have thrown aside all ethical considerations and are devoting their time to violating the law. I was told in Washington that there are abler chemists in civil life than in the government service, which perhaps accounts for the successful recovery of denatured alcohols on a large scale. That some of the men engaged in alcohol recovery are members in good standing of the less restricted chemical societies is deplorable, and perhaps is due to the prevalent conditions of non-employment.

The only way the Department of Plant Control can tell whether a plant operates legally is by comparing the amount of alcohol-producing material used with the amount and nature of the products obtained. Inasmuch as methods of operation differ with every plant engaged in the manufacture of vinegar, yeast, alcohol, or cereal beverages, the yields to be expected vary greatly; and no hard and fast rule can be set down as to what constitutes a legitimate loss in plant operation.

The men in charge of government plant control therefore ought to be trained chemists of known integrity; and they should preferably be fermentation chemists where the control pertains to alcohol plants, breweries, vinegar plants, and yeast plants. Only such men understand fully the difficulties of operation and can assay properly permissible differences of yield. Today most of the men formulating regulations are statisticians and laymen who have had no training in engineering and in technical problems. As a result, the forms for control are burdensome to the man in charge of the plant; and because they lack vital information they are of little use to the Department.

IN ANOTHER direction lack of government aid is doing active harm. A considerable amount of alcohol and alcoholic beverages is consumed by the American public. The brewing of beer and the making of wine in the home is a common practice. Unfortunately, however, all government publications describing the production of alcoholic beverages were withdrawn from circulation at the time the Eighteenth Amendment went into effect. The average citizen producing his wine consequently knows very little about the factors which contribute to a pure product.

My own analytical work has shown that an appreciable percentage of home-made wines contain small amounts of wood alcohol, derived from pectin in the skins and stems of the grapes. The physiological action of this methanol is well known. Even if consumed in very small quantities, it gradually accumulates; and after prolonged use the characteristic symptoms of the poisoning become apparent.

The formation of wood alcohol with pectin as a source has been scientifically established. According to T. Fellenberg (*Biochem. Z.*, **85,** pages 45 and 118), the pectin occurs in unripe fruits in an insoluble form, pectose, or as the protopectin which comprises a considerable part of the membrane. As a result of ripening, the pectin is hydrolyzed into a colloidal soluble pectin. During fermentation the pectin is changed by the enzyme pectase into pectic acid and methyl alcohol; but if the pectase is destroyed, no methyl alcohol is formed even after prolonged periods of time.

According to Ehrlich and Von Sommerfeld (*Biochem. Z.*, **168,** page 263), the breaking down of pectic acid as a result of total hydrolysis is represented by the following equation:

$$C_{42}H_{62}O_{37} + 10H_2O = 4C_6H_{10}O_7 + 2CH_3OH + 3CH_3CO_2H + C_5H_{10}O_5 + C_6H_{12}O_6$$

There are various other theories as to how the methyl alcohol is formed from pectin during fermentation. According to some, the type of yeast has a great influence; others are of the opinion that the action is due entirely to the presence of heat and dilute acids.

According to my laboratory records 100 cc. of a distillate containing 90% of alcohol and obtained from wines produced by the fermentation of (*a*) practically clear grape juice, (*b*) fermentation of the whole grapes without stems, and (*c*) extensive fermentation in the presence of the husks of grapes, seeds, etc., showed the following percentages by volume of wood alcohol:

(*a*) Trace
(*b*) 0.2 to 0.35%
(*c*) 0.3 to 0.65%

In this connection, I doubt whether it is generally known that the now common practice of aging corn alcohol artificially by means of an electric heater often leads to the formation of appreciable quantities of wood alcohol. In a particular case which came to my attention, corn alcohol of good purity was put into a charred oak barrel and heated with an electric immersion heater. A prominent local business man

had purchased this heater, but got from the salesman only half the information necessary for its proper use. His barrel was almost full, the heater passing through a bung with only a small opening to relieve pressure. The heater was left on overnight. Next day the liquid had a disagreeable dark color and an unpleasant odor and taste. My test for methanol, made chemically and confirmed with the Zeiss Refractometer, showed in excess of 1.9%.

I HAVE mentioned only some of the problems which concern the chemist and the physician as well as the manufacturer who uses alcohol. It is imperative that alcohol legislation and control be in the hands of men who have the requisite technical training. Such men will understand what steps must be taken to safeguard the public from impostors and from itself. Under scientific control, with regulations formulated by men of intelligence and scientific training, the work of those who are obliged to operate under alcohol permits would be rendered much less onerous and trying.

Chemist to the King of Khem

By Frederick D. Crane

An interview with the court scientist of a great ruler. The chemical methods used for some unusual problems.

WHILE in Cairo it was my very great good fortune to meet Mr. Alfred Lucas, chemist to the King of Khem. The King, who takes all the time of Mr. Lucas (and has for the past ten years), is Tut-Ankh-Amen, whose coffins, jewels, and furniture are still not entirely restored and made ready for permanent exhibition. Mr. Lucas, a Fellow of the English Institute of Chemistry and a member of 30 years' standing of the American Chemical Society, has written several books, among them a unique and invaluable volume on the *Materials of Egyptian Art*.

Mr. Lucas kindly told me something of his methods, for publication in THE CHEMIST.

"The first thing to use is common sense. Find out, if you can, of what material the thing you have to restore and preserve was made,

then use gentle mechanical means to get off the dust and dirt. If a solvent must be used, begin with water. While there isn't much rain in Egypt, there is a little; and in the last two or three thousand years, water has often seeped into the rock tombs, saturated the contents, and then slowly evaporated or leaked out. This has often left a layer of carbonate of lime; and sometimes the lime has acted as a cement. Weak acetic or hydrochloric acid will clean it away.

"The gold-leaf was often laid on a base of glue and whiting. When this has decomposed, a new base must be substituted. A layer of paraffin wax may often be used to hold parts of an object in place. It is permanent and invisible. Metal objects, other than gold or silver, are frequently much attacked. Often they may be cleaned with dilute acids, or electrolytically, but the acid should be used with great caution. When a gum-like material is found, experiments will show, if it is water-insoluble, what other solvent may best be used."

Materials Easy to Destroy

"Most of the colors which still remain are mineral. The danger in cleaning them is that the entire surface will be removed, as the ancient binder, the nature of which is not certainly known, has sometimes decomposed. A coat of celluloid will frequently restore the brightness of the color, but should be used with care. Early investigators sometimes varnished tomb-paintings, in order to copy them more easily. In a few years the varnish blackened, and the entire painting has now gone.

"Time and dryness have often so changed the wooden parts of objects that it is hopeless to try to use the original. The best thing is to substitute modern wood, accurately made to the original size.

"Leather has, in some instances, remained in fair condition. In other cases, an obscure decomposition has taken place, and the resulting glue-like mass is hopeless.

"Textiles are extremely fragile but can sometimes be unfolded, as in the case of some of King Tut-Ankh-Amen's robes. Papyrus sheets are often very brittle, but if previously dampened can usually be unrolled or separated."

This spring Mr. Lucas has been working on the last lot of these tomb relics from the Valley of the Kings, and expects to restore and preserve for almost all time the most remarkable group of ancient objects ever found.

A Suicidal Barter

By Francis P. Garvan

Chilean nitrate to be traded for American wheat? Recent price reductions by the Chilean nitrate monopoly. The Treasury Department finds Germany, Poland, and Belgium guilty of dumping sulphate of ammonia.

THE international nitrogen cartel, of which Chile, Germany, Belgium, Poland, Holland, England, and other nitrogen-producing countries are members, has concentrated an attack upon the American nitrogen industry in a desperate effort to wipe out an industry without which we would be helpless in peace and in war. First—we have the proposal of the Chilean monopoly, a member of the international cartel, to exchange 40,000 tons of Chilean nitrate for 2,500,000 bushels of wheat held by the Federal Farm Board. Second—we have the decision of the Secretary of the Treasury that Germany, Belgium, and Poland, also members of the international cartel, have been guilty of dumping thousands of tons of sulphate of ammonia into this country to the injury of the American producers. Third—we have the recent announcement of the international cartel, through Chile, of a drastic reduction of $11 a ton in the price of Chilean sodium nitrate in this country, making the price of $25 a ton the lowest on record.

The proposed trade of Chilean nitrate for American wheat will mean the use of money belonging to the taxpayers of the United States for the purpose of breaking down an American industry which has made the United States independent of the world for the nitrogen used in agriculture, in industry, and in our national defense. It will mean the use of American money to support an international nitrogen cartel composed of Chile, Germany, France, England, and all other European nitrogen-producing countries.

This cartel has been organized in principle and will take its final form about September 15th. Its purpose is to allocate the markets of the world, regulate prices, and reduce selling expenses; and it is aimed at the destruction of the fixed nitrogen and synthetic nitrate industry in the United States. The Federal Government, instead of trading American wheat for Chilean nitrate, should investigate the recent price reduction of Chilean nitrate to ascertain whether or not there has been a violation of that section of the Tariff Act which prohibits unfair competition and dumping.

AMERICAN chemists, physicists, and engineers, through their development of the fixed nitrogen and synthetic nitrate industry in this country, have made us independent of what was once a monopoly—the Chilean nitrate industry. If our American industry is wiped out, it will mean a return to the old conditions. It will be recalled that back in 1915 the Germans, through Admiral von Spee, endeavored to shut off our supply of Chilean nitrates, without which we could not make the munitions which enabled our allies to continue the war. It will also be recalled that Germany could not have continued the war had it not been for the development of the Haber Process for fixing nitrogen in the form of synthetic ammonia.

The proposal that the Federal Farm Board exchange 2,500,000 bushels of wheat for 40,000 tons of Chilean nitrate is contrary to the policy laid down by President Hoover, then Secretary of Commerce, in 1926 when he appeared before a committee of Congress and urged that steps be taken to make America independent of a number of monopolies, among them the Chilean nitrate monopoly.

The importation of 40,000 tons of nitrate into this country at the present time, in return for 2,500,000 bushels of wheat, will mean an increase in the number of unemployed in this country. I do not think the American people will stand for our government using our money to support a foreign cartel aimed at an American industry.

THE unfair competition to which the American nitrogen industry has been subjected is attested by our own Treasury Department, which recently found German, Belgian, and Polish members of the international nitrogen cartel guilty of dumping thousands of tons of sulphate of ammonia into this country. These three countries have put up trade barriers in the form of tariffs and restrictions which make it impossible for American producers of sulphate of ammonia to ship a single ton of this commodity into any one of these countries.

The findings of the Secretary of the Treasury state that the industry of producing sulphate of ammonia in the United States is being injured and is likely to be injured by reason of the importation of sulphate of ammonia from Germany, Belgium, and Poland and its sale in the United States at less than its fair value.

The Secretary of the Treasury still has under consideration allegations of dumping against Holland and England, also members of the international nitrogen cartel.

At the present time American producers of sulphate of ammonia and other nitrogenous compounds are more than able to supply the entire needs of this country. If the Federal Farm Board desires to send or sell 2,500,000 bushels of wheat to Chile, some way other than that of trading it for Chilean nitrates should be found. It should not be done at the expense of American workmen, of our taxpayers' money, and at the cost of destroying an industry without which the country is helpless in peace or war.

Cooperation Necessary

A report of the September meeting of the Philadelphia chapter. Frank G. Breyer tells about the work of the Committee on Unemployment. The difficulties met in helping chemists with their economic problems.

AT A special meeting on September 22nd, to which was invited the Philadelphia section of the American Chemical Society, Mr. Frank Breyer, chairman of the Committee on Unemployment and Relief for Chemists and Chemical Engineers in the Metropolitan area, was the speaker. Mr. Breyer first told how hard it is to arouse among chemists any real interest in a movement to improve their economic position. Chemists have never acted as a body for their own welfare, as have the doctors and lawyers. They are, however, slowly becoming professionally conscious; but cooperation is necessary to make this effective, and it is hoped the unfavorable economic situation today may prove to be the driving force needed to bring about concerted action. There may be some question as to the form of organization; but to meet the present crisis the chemical profession must

organize. The existing unemployment problem is merely a phase of a more fundamental economic problem involving the future well-being of chemical workers.

During the inflated period after the war the demand for an outlet for large amounts of capital led to the development of a multitude of research laboratories and to a greatly increased demand for chemists and chemical engineers. All this has now changed, and we are facing a lack of expanding credits, a lack of promoters, and a lack of money. The only sound attitude to take in such a crisis is to prepare for the worst and hope for the best. Will the factors which resulted in the employment of so many men ever return, or will there be a still greater decrease in the demand for chemists?

IN THE immediate situation, an important phase of the problem is to save the men now unemployed from the mental and moral breakdown which seems to threaten so many of them. Many are unwilling even to register with the Unemployment Committee, feeling that somehow it injures their future status, and they must be reassured. The problem, however, must not be approached from a sentimental viewpoint. It is merely the result of the operation of the fundamental economic law of supply and demand, and therefore little improvement can be expected for a long time.

In many industries, no reduction of the personnel is necessary, and yet even in these cases high-priced men are let out and younger, cheaper men are hired to take their places. These are facts, and we can do nothing about them at present except to work with the other technical groups. Fretting about consolidations and the resulting technological unemployment will accomplish nothing. An unfortunate aspect of the situation is that most men with jobs seem to believe themselves immune to the depression. No industrial chemist is safe—nor are the teachers free from danger, for the income of colleges has been seriously reduced and may be reduced further.

WHAT must the chemist and chemical engineer do, not about the immediate and acute problem, but about the broader problem? He must become more economically minded, he must cooperate with other chemists. A start has been made in New York by the formation of the Committee on Unemployment and Relief and in Philadelphia by the Technical Service Committee. In New York a total of 151 men received employment through the committee last winter, but 536 were not helped at all. For the approaching winter $50,000 is needed for

relief. It is planned to raise half of this by personal solicitation from individuals, and half from industry. This will be the first time chemical men have shown a degree of professional solidarity, and may indicate that they will perhaps be prepared to cope as a group with a new economic situation.

* * * *

In commenting briefly upon Mr. Breyer's address, Mr. Eugene F. Cayo, chairman of the Pennsylvania chapter, paid a tribute to the work being done in the Philadelphia area by the Technical Service Committee, and then turned the chair over to Mr. K. M. Irwin, chairman of that committee. The plans for the coming winter in Philadelphia include efforts to raise $60,000 by personal solicitation from members of the various technical societies, each person being requested to pledge a day's pay every month for six months. In Philadelphia the so-called "made work" is badly named, for it has included the performance of very valuable and necessary service for the Philadelphia Traffic Bureau, Bureau of Building Inspection, Electrical Bureau, the Franklin Institute, and the Chamber of Commerce.

Mr. Renshaw Borie, managing head of the committee's activities, in giving some of the figures collected, stated that the chemists were less badly off than other technical men. There are only about four chemical men waiting for every job. In the other engineering lines there are many more. Then too, only about 6% of the chemists registered are in financial distress, a much lower proportion than in the other fields. Mr. Borie said that conditions seem to be improving, especially in the textile industries. To date a total of 110 applicants out of 1069 registered have been placed in positions believed to be permanent.

Mr. E. H. Ocker, employment manager of the committee, spoke briefly about the more permanent aspects of the work, as represented by a study of business trends, causes of unemployment, and a general survey of business conditions in this field. About 25% of the chemical workers normally employed in this area are now unemployed.

Others who took part in the discussion were Mr. C. E. Billin, secretary of the Engineers' Club, and Dr. Carl Haner, chairman of the Philadelphia Section of the American Chemical Society.

HOWARD STOERTZ, *Reporter*

An Administrative Chemist

By Horace G. Byers

The story of Dr. Henry G. Knight, the new president of The American Institute of Chemists. A chemist whose ability as an executive made him chief of the U. S. Bureau of Chemistry and Soils.

IN THE fall of 1899, shortly after the writer assumed charge of the department of chemistry of the University of Washington, at Seattle, there appeared a tall, slim, and somewhat awkward young man, with fair and already receding hair. He had been promised a job as laboratory assistant at fifteen dollars a month, and he was quite anxious to have the appointment confirmed. It was, though he still holds a grudge because an economy measure reduced the stipend by $33^1/_3$ per cent. That young man, still tall, still slim, and with hair receded almost to the vanishing point, is now president of The American Institute of Chemists, and chief of the Bureau of Chemistry and Soils at Washington, D. C.

A very considerable number of things have occurred to him and to his associates in the interval between 1899 and the present. Without doubt some of these will be of interest to the members of the Institute: to his contemporaries because of community of interest, and to the younger element as illustrative of how and why at least one individual has attained distinguished success in a given field. Unquestionably the more important events of a life are those occurring during mature years; at least, they are more important to others. Yet, in order to realize clearly how these things came to be, it is necessary to examine the earlier history of the subject.

Henry Granger Knight was born on a farm near Bennington, Ottawa County, Kansas, July 21, 1878, and owes his given name to a buffalo-hunting companion of his father. Impelled by a series of crop failures, the family moved to Port Townsend, Washington, when Henry was about nine years of age. Due to the death of his mother soon after arriving at Port Townsend, the lad was committed to the care of his maternal grandparents, farmers at Leland, Washington, who were able to supply his physical needs and make it possible for him to complete his high school education. In this task the boy was of material aid. He began his long period of gainful employment at the age of ten as man-of-all-work in a clothing store and returned to help on the farm as soon as he was large enough. Meanwhile, he attended a one-room country school and there was able to finish more than two years of the three-year high school course he completed at Port Townsend in 1896.

In that day no tuition was required at the Washington State University, and no intelligence tests or high school quotas intervened between a high school graduate and matriculation at the University (*Gott sei dank!*). Also, for the benefit of those communities not able to maintain a four-year high school, the University provided preparatory courses. All that was required of a high school graduate for admission to the University was personal initiative and sufficient resources to provide clothing and food.

Henry Knight's parentage had supplied him with plenty of initiative, and he himself furnished the necessary financial support by distributing morning papers. While the money for this service did not enable him to live in luxury, it was adequate to keep soul and body together. The job did not interfere with school activities, but it did materially curtail the sleeping period. The character of the young man was already formed, as is evidenced by the fact that he was soon promoted to delivering papers with a horse-drawn cart. Incidentally, this came close to cutting short a promising career. One misty morning he awakened from casual slumber on the seat of the paper cart to find himself and the horse on their backs, the cart wheels spinning uselessly in the air. There was in this a well-learned lesson: he has never slept on the job since.

THE University followed what was then known as the "Harvard elective system," which placed few restrictions on the students in their choice of studies. Knight, impelled to select chemistry as a major by an ambition to become a physician, found himself attracted to the subject for its own sake, and at the end of his college course had

more than one-third of his credits in this subject. While it is true that by present standards this was an unbalanced curriculum, its choice showed a singleness of purpose quite in keeping with his subsequent career.

In spite of narrowly limited finances and the double load of college work and self-support, the young man found time for plenty of college life and was a leader in many activities. He became a member of the Phi Gamma Delta fraternity and learned to dance. A marvel of financial astuteness enabled him to buy and learn to wear the party attire proper for a socialite. As we look back on those days, it is still surprising to think that a lad, who on one Thanksgiving Day had no money and no resources beyond a ticket to the football game, could within a year be the leader of the Junior prom.

In the college year 1901–02 Knight did all the laboratory work involved in what amounted to a survey of the water resources of the Puget Sound area, the results of which were published in the State Geological Bulletin of that year. He not only completed his full course in the scheduled time, but at the end of his senior year found himself with sufficient credits for his master of science degree, with the exception of a thesis. After graduation (1902), opportunity for graduate work became possible through the offer of an assistantship at the University of Chicago. This offer had a string attached: it was to be granted if he made good in his work on organic analysis in the summer session. That summer was abnormally hot, and on one occasion a visitor to his laboratory noted a temperature of 135 degrees Fahrenheit on the side of the room opposite the furnace over which he was working. He did make good on this job and had sufficient energy left to meet and court Miss Nellie Elizabeth Dryden who later became his wife.

The four quarters at Chicago, with his previous experience, warranted the offer of an assistant professorship at the University of Washington. This offer was accepted, but before the end of the college year (January, 1904) Knight was invited to take the position at the University of Wyoming which had been vacated by Dr. E. E. Slosson when the latter became literary editor of the New York *Independent*.

This opening gave scope to the young man's talents. As state chemist, as well as professor of chemistry, he threw himself into the pure food campaign and, in a state fed largely out of cans, attracted attention to the problem by extracting a large number of artificial colors from canned goods then on sale in the state. He made his work doubly effective by a display at the State Fair of strips of cloth dyed with the colors extracted, and headed by the caption "And So They

Dyed." His work as state chemist was also advertised by a similar display of insecticides, with the injunction "Let Us (S)Pray."

In carrying out such work he did not lose sight of his teaching, nor did he fail to distinguish between favorable and unfavorable publicity. On one occasion, when a bag of hydrogen (there were no compressed gases in cylinders in those days), which was being used to supply an oxy-hydrogen blast lamp, exploded with sufficient violence to shatter the classroom windows, he was adroit enough to persuade the local reporter that such incidents were normal to classroom experiments, and therefore were not news.

SUCH a man could not well avoid advancement. He became, successively, director of the State Agricultural Experiment Station (1910) and dean of the College of Agriculture (1911). Quite in harmony with his general behavior, he found time during this period not only to get married (1905) and to learn to drive a Ford (he now drives a Lincoln), but also to hunt and fish over practically the whole of Wyoming.

Incident to this part of his career was the belated discovery that a doctor's degree was a *sine qua non* for many higher positions, and the further discovery that along administrative lines lay his best hope of further development. A detail like a doctor's degree was easily met, and a year's leave of absence at the University of Illinois with Professor B. S. Hopkins sufficed for the purpose (1917). His thesis, an intensive study of the acidity and acidimetry of soils, appeared in four successive articles in the *Journal of Industrial and Engineering Chemistry* for 1920. These publications practically conclude his published scientific research. Up to 1918, as the list of Wyoming State Bulletins will show, he had been very active in personal conduct of research, despite the continually increasing load of administrative work. In this research, as was fitting, emphasis was placed upon those studies which would tend to make Wyoming a better state in which to live.

The newly made doctor returned to Wyoming to serve his part in the Great War as chairman of the State Defense Council. During 1918 he accepted the position of Dean of the College of Agriculture and Director of the Experiment Station at Stillwater, Oklahoma, where he remained for three years. The condition of affairs in the State College of Oklahoma in 1918, as was the case elsewhere at the close of the war, was somewhat chaotic. Because of the resignation of the chemist of the station, it was necessary for the new dean to take personal charge of classes in chemistry as well as to supervise research.

When these emergencies were past, he devoted himself to the organization of research directed toward development of the state's resources, particularly the forage crops and the livestock industry.

UP TO this time, Dr. Knight's career had been singularly free from check and conflict. It consisted simply in working or playing with enthusiasm and concentration at the problem immediately at hand. At Stillwater, however, a problem of a new kind presented itself. In the fall of 1921 one of the frequent political upsets of that politically turbulent state confronted him with the choice of going along with the victors in a course he believed to be wrong, and in which he believed also he was to be made the scapegoat, or resigning his position.

There was no hesitation about his decision. He resigned, and went to Cornell University as an honorary fellow, while he sought a new opening. This appeared in the form of the directorship of the agricultural experiment station at West Virginia University (1922). Running true to form, in a few years he was appointed dean of the College of Agriculture. As a matter of fact, this advancement did not occur until after a residence of four years, though as a matter of record he was appointed dean of the college within six months of his arrival. This appointment was made at a meeting of the Board of Regents just before adjournment for dinner, and was rescinded immediately after dinner on the ground that it would not be good policy to spoil an energetic and resourceful research man by diverting him to mere administration. This betokens a rather rare appreciation of research on the part of university trustees.

In West Virginia a new set of problems presented itself, and Dr. Knight wasted no time in attempting to put new wine into old bottles. The immediate need seemed to be the coordination of the research of the station into a systematic effort to improve the conditions and increase the profits of agriculture within the state. This effort manifested itself in the study of market gardening, with particular reference to potatoes, poultry, and dairying. Cooperative work in the apple industry was done by Pennsylvania, Maryland, Virginia, and West Virginia. The work was unique in character and had excellent results, for Dr. Knight not only enlisted the cooperation of his staff but also was able to secure the material aid and moral support of the business men of the state. He encouraged cooperative work with the agencies of the Department of Agriculture at Washington, particularly with respect to the dairy industry.

Shortly before the death of Professor Milton Whitney, chief of the

Bureau of Soils, the authorities at Washington decided to take out of the Bureau of Chemistry the food and drug regulatory activities, inaugurated through the crusading spirit of Dr. Harvey Wiley, and to unite the research activities of the Bureau of Chemistry with the Bureau of Soils. To be included in the merger were also the investigations on the fixation of nitrogen and allied topics left over from the intensive research during and immediately following the World War. To this composite Bureau were also to be added certain lines of research then included in the Bureau of Plant Industry but more intimately connected with soil research. To secure a suitable chief for such a diverse set of activities was recognized as a difficult task, and the ultimate outcome was the selection of a bureau chief for the first time through the Civil Service Commission, aided by a special committee of chemists. The person selected was Dr. Knight; and he entered upon his duties in the fall of 1927.

IT IS impossible, perhaps, for those unfamiliar with government service, to appreciate fully the combination of tact, foresight, firmness, judgment, political sagacity, and technical knowledge required to weld so many elements into a working unit. Some idea may be conveyed by calling attention to the following facts. The Bureau of Chemistry and Soils requires approximately three hundred and twenty professional employees and about two hundred others ranging through a wide field of activities. The investigations include studies upon the utilization of agricultural wastes, sugar, food preservation, leather and tanning, naval stores, oils, fats and waxes, insecticides, dust explosions, peat, soil surveys, soil erosion, soil fertility, boll weevil control, soil chemistry and physics, soil microbiology, nitrogen fixation, potash production, phosphates and phosphoric acid, and concentrated fertilizers. Many of these lines of work are cooperative with the states.

It is obvious that no one person can have direct and intimate supervision of so wide a field, yet the chief of the Bureau must have a clear comprehension of all the problems and of the general mode of attack. He must also be able to guide and control the trends of research development to promote research along selected lines, and to guard against unwarranted attack. The task was the more difficult because, even geographically, the new Bureau consisted of widely scattered units. Not only were its activities spread through field work from coast to coast and from Canada to the Gulf, but even in Washington the divisions were then housed in many different buildings. That Doctor Knight has succeeded to a very marked degree is well known. One

of the outward signs of his success is the gradual increase of support of the Bureau's activities from approximately one million dollars in 1928 to approximately two million in 1933. This is but a symptom of a spiritual development and coordination much more far-reaching and important, which cannot be expressed quantitatively.

IT MAY appear irrelevant at first to mention in this connection that during the years Dr. Knight has accumulated an enormous fund of incidents collected from his contacts, and a fund of stories selected the Lord knows how. They are of Lincolnian variety and are used in like manner. They are oil in the wounds of strife, emollients in angry argument, and restful interludes in difficult tasks. They have been a real factor in the handling of both men and problems in the work of the Bureau.

All Dr. Knight's tasks and troubles have not been sufficient to abate a still youthful ardor or confine his interests within a narrow field. He can become deeply engrossed in a game of contract bridge—which is to him a game of poker—and in golf, which he plays wildly rather than well. Also, if the reader wishes to know when a man ceases to love dancing, he will have to ask someone older than Dr. Knight.

In 1932 he was elected fifth president of The American Institute of Chemists. The work will be an added burden upon already heavily weighted shoulders, but the Institute is to be congratulated on his accession. He will guide its activities discreetly, efficiently, and harmoniously; and he will bring it near its ultimate goal of service to the chemists of the country to the degree to which the plans of the Council are enthusiastically supported by the membership.

Philadelphia Unemployed

By Renshaw Borie

Research by the Technical Service Committee* shows what type of man is now looking for engineering work in the Philadelphia area. Placements by the committee. The chemical engineers.

AN INTERESTING phase of the activities of the Technical Service Committee is research. This is to determine present economic conditions and future trends as they affect the various engineering professions, and to guide educational institutions in directing the prospective engineering student to the field in which there is the greatest chance for his development.

An analysis of the applications on file now gives us some interesting statistics on the unemployed engineer.

Classification of 946 engineers registered with the P.T.S.C.:

PROFESSIONAL ANALYSIS

Architectural	15	Industrial	10
Chemical	88	Mechanical	355
Civil	214	Mining and Metallurgical	20
Electrical	182	Miscellaneous	14
Structural	48		

Fifty per cent of all new registrations are proportioned between civil and mechanical engineering, with the mechanicals predominating probably because of the industrial nature of Philadelphia's industries.

SALARY

48% of all technical men registered received $2500 a year or less.
29% received between $2500–$3500.
17% received between $3500–$5000.
Only 6% received over $5000 a year.

The percentage in the wage groups supports the oft-made assertion that services are undervalued.

* Headquarters, the Engineers' Club, 1317 Spruce Street, Philadelphia, Pa.

Age Groups

35% are under 30 years of age.
34% are between 30 and 40 years of age.
24% are between 40 and 50 years of age.
Only 7% are over 50.

Education

78% of the registrants received their educational training in United States colleges.

12% were educated in foreign colleges. This leaves only a small number, 10%, without this training.

Approximately one-third of the applicants are members of technical societies. 63% are married.

50% are qualified as designers and draftsmen, largely because of the emphasis placed upon this phase of engineering in their field of training courses.

Altogether the men registered have experience in 115 varied occupations in over 200 diverse industries, and include 70 different types of engineers.

THE work of the committee is divided into placements, field contacts, publicity, and research.

Approximately 2500 firms have been contacted personally and by letter. Results in the effort to place men have been satisfactory under the prevailing conditions.

Salary Jobs

134 requests for men were received; 62 local firms—25 from out of town; 383 men were referred to the employers, of whom 82 were placed.

Commission Jobs

99 requests were received from 43 firms (42 were local). 121 men were referred to them and 12 were placed.

Made Work

In the examination of 135 cases for relief, 30 of the urgent ones were given remunerative work, directly negotiated for and sponsored by the Philadelphia Technical Service Committee.

Our largest request for men was received in May. Altogether 124 placements are recorded to date.

The importance of this work to the future welfare of the engineering professions cannot be under-estimated; and the cooperation of all employing executives who normally require engineering personnel is requested, to the end that the best interests of both may be served.

Although the primary object of the Philadelphia Technical Service Committee is the clearance of engineering personnel, the assembling of data pertinent to employment conditions and trends for the various professions in the Philadelphia area also engages their serious attention.

Letter questionnaires were sent to 785 employing firms within fifty miles of Philadelphia—which is approximately the sum total of the firms in this area employing chemists and chemical engineers. Replies were received from 188 firms, which gave out the information that normally they would employ 1239 men of the above type. The assembling of the reports, all of very recent origin, indicates that the percentage of unemployment in that part of the chemical industry is 22½%, the number reported employed being 946. Of the employed group, 30% are working part time.

What Will the Profession Do?

By Robert L. Holliday

The C. U. C. is merely an instrument of the chemical profession. Will chemists decide to jeopardize their own positions?

WITH another winter approaching and the unemployment situation continuing, it is time for the chemical profession to look the facts squarely in the face and to determine what responsibilities are theirs. There are more chemists and chemical engineers out of work than ever before, and the whole field remains threatened with a drastic reduction in the salary scale. If a man is hungry, he will not stop to insist on past salaries, but will take a job at a lower wage. Industry is realizing this; and the profession must be brought to recognize that unless unemployed chemists are given needed assistance, the time is surely coming when the scale of re-employment wages will be considerably below what it is even now. This will mean that men who have been fortunate enough to hold jobs will have to defend their salaries against the competition of less fortunate

men who, in desperation, are forced to accept considerably less money in order to live.

The survey of the C. U. C. plainly shows that the chemists registered as unemployed are a true average of the chemical profession; and this means that these men are entirely competent to compete with the men now holding positions.

If we had sufficient funds, we could take care of the situation by placing these men on fundamental research in the colleges; but thus far the response to our call for contributions has not met with the success hoped for, and we are faced with the problem of carrying on without proper funds. Of every dollar subscribed, ninety-two cents goes directly to the men receiving relief, so that any contributions made are practically direct ones.

It is not our place to do other than call the whole matter to the attention of the profession. If the chemists choose to ignore the situation, then future salary scales will be entirely on their own shoulders. Likewise, if the present employed chemists sit back and calmly view the situation without trying to assist, they will awake some morning to find their own jobs in jeopardy, or at least subject to a drastic salary reduction through competition.

IT IS virtually impossible for us to reach all the employed men; and we certainly feel it is their problem as much as ours. We have sent out some 4000 letters of appeal, from which we received 640 answers. To date some $7521 has been contributed. This has allowed us to take care of about seventeen men for the past six months at a weekly pay-roll of approximately $300, an average of $18 per week per man. We have enough left for about five more weeks. After that, what? Frankly, we don't know. We can only ask the profession what they are going to do about it. We might add that in soliciting contributions we have asked only minor contributions. Contributors in many cases have subscribed far more than asked; but a large number have given nothing.

The Professional Engineers' Committee on Unemployment, a group representing the civil, mechanical, electrical, and metallurgical groups, has shown the way during this depression. Employed members of these groups have gone so far as to subscribe 1 to 2% of their salaries to help their less fortunate brothers, and they have produced results. They have kept an immense number of engineers out of the field of competition as to salaries. We are not so fortunate—but we ought to be. What will the profession do about it?

Educating Chemists in Canada

By Nevil Norton Evans

The story of McGill University. Evolution of one of the best of the Canadian chemistry courses. Special problems.

"IN THE days of James McGill, Montreal was a small town of from twelve to fifteen thousand inhabitants, and of these the large majority were French. One-third of the houses were wooden huts. The trade with foreign countries was exceedingly small. The entire carrying capacity of ships annually arriving at Quebec did not exceed 12,000 tons, and only a few of these ships went on to Montreal. In 1813, the year of James McGill's death, only nine vessels entered Montreal from the sea, and their total capacity was but 1580 tons. At the end of the 18th century, the exports of furs and other products from the entire province was little more than half a million pounds sterling. . . . Such was the primitive city in which James McGill laboured and amassed his wealth. . . . He worked like his ancestors for the building of churches and schools and court houses, symbolic of religion, education, and law, as milestones of civilization in a new land, and without which no country could make progress. . . . And so he dreamed of a great university which would not only be local in its usefulness, serving a small city which his faith told him would one day grow to giant size, but also national in its influence, and ministering to the enlightenment of that larger Canada which his vision saw in the far and dim distance." (Macmillan, *McGill and Its Story*.)

In the year 1811, this Canadian Scottish merchant made a will, in which he left his home of "Burnside," with 46 acres of land situated at that time outside the little city, together with the sum of ten thousand pounds, to found a college or university to bear his name. This was

just three-quarters of a century after Canada had been ceded by the French to the British. There were but few English-speaking citizens; and almost no educational facilities, not even schools, except those conducted by the Roman Catholic Church for its French adherents, had as yet been developed.

DUE to litigation and other troubles, it was not until 1821 that a Royal Charter for a university was obtained; and another twenty-two years elapsed before buildings were erected and classes started in the Faculty of Arts. In the meantime, however, the Montreal Medical Institution had been organized by a few of the members of the staff of the Montreal General Hospital (opened 1822); but, not having been incorporated for that purpose, it could not grant degrees. In 1829, when McGill University was officially opened—but without any students—this Medical Institution was engrafted on the University and became its Faculty of Medicine, thus enabling it to grant degrees. The medical department of the University led a more or less independent existence until about 1900, when it became an integral part of the University.

The first buildings, two in number, were begun in 1842 and opened on the 6th of September, 1843, at which time actual teaching was started in the College (Faculty of Arts). Soon after this we find the first notice of instruction in chemistry, given by one of the medical doctors, and intended primarily for the students of the medical department. There was no laboratory, and very little apparatus for the illustration of the lectures.

Until 1862 the college consisted of the two unconnected buildings mentioned above, one somewhat larger than the other, side by side, but separated by a short distance. In this year, thanks to the generosity of a Montreal citizen and his wife, a third building was erected near the original two; and these three buildings were connected by one-story structures, thus making a tripartite symmetrical whole. One of these little connecting structures contained a natural history lecture room, amphitheater in plan and seating about one hundred students, a chemical laboratory, and two smaller rooms, one for balances and other apparatus, and the other for the use of the professor. This was the beginning of the academic chemical department.

The laboratory was curiously designed. It was a fairly high room, about thirty feet square, floored with brick. Around three sides ran a wide wooden platform three steps up, with work-tables having cupboards underneath and shelves against the walls above, gas laid on, and

four little circular wash-basins and one large kitchen sink let in. There were thus afforded work-places for perhaps ten students. On the brick floor in the center, which was filled in underneath with earth and clay to render it fire-proof, there later stood two lead-topped tables on which ran a gas-pipe with outlets, and connected by a rubber tube to a gas fixture hanging down from the ceiling. In the dark cellar underneath the class-room were two assay furnaces and a large cast-iron mortar for the hand-grinding of ores.

In the late fall of 1882, the old chemical laboratory was refurnished with what at that time were regarded as very modern work-tables, and the accommodation was thus enlarged so as to enable 24 students to work at one time. Two years later, when women students were first admitted to the Arts Faculty, this part of the building was raised a story to provide three or four class-rooms for their accommodation—because for some years they were not allowed to attend classes with the men. At the same time a small wing (for men) was added behind, containing two laboratories to accommodate 24 students each, together with balance rooms, apparatus room, chemical room, professor and assistant's laboratories, etc. In this way there was provided laboratory accommodation for about seventy-five students in all.

Until the opening of the Macdonald Chemistry and Mining Building in 1898, students were required to purchase their own chemicals, glassware, burners, retort and filter stands, etc.; only special pieces of apparatus, and chemicals used in very small quantities were supplied by the laboratory.

IN 1898 an enormous expansion in space and equipment took place. Sir William Macdonald, a Canadian born in Prince Edward Island, but afterward living and doing business in Montreal, and whose various gifts to McGill University have totalled more than twelve million dollars, built, equipped, and endowed the Macdonald Chemistry and Mining Building. Chemistry occupies the main part of the building: there are three large laboratories, originally planned to accommodate eighty, sixty, and forty students, respectively; smaller laboratories designed for organic chemistry, physical chemistry, gas analysis, iron and steel analysis, electrolytic analysis, blowpipe analysis, organic combustions, etc.; class-rooms, a departmental library, offices and private laboratories for members of the teaching staff, and special rooms for research work carried on by members of the School of Graduate Studies.

For some years after the opening of this building, there was room and

to spare; but of late years the accommodations and equipment have become more and more inadequate to the demand. The attic has been fitted up, and certain of the special laboratories, *e. g.*, those for iron and steel analysis, gas analysis, electrolytic analysis, have had to be turned over to research students, the special work supposed to be carried on in them being done in the general laboratories. The capacity of the main laboratories has also been extended by the introduction of extra tables and lockers, the elementary classes being obliged to work in sections. A large laboratory in another building, formerly used by medical students, has, since the amalgamation of that faculty with the university, been used as part of the chemistry department. Naturally this crowding interferes with the efficiency of the department, but at present there seems to be no other way out of the difficulty.

So much for the "bricks and mortar." The courses given, and what is of most importance, the men giving them, can be treated only very briefly.

The first notice of chemical instruction which has been found, comes from the announcement for the session of 1861–62 and reads as follows:

CHEMISTRY

Professor, W. Sutherland, M.D.

Every day except Saturday—7 to 8 P. M.

1.—Inorganic Chemistry, comprising Heat, Light, Electricity, Galvanism, Crystallography, the Laws of Combination by Weight and by Volume, the Gases and Non-Metallic Elements and their Compounds; the Metals, their Combinations and Modes of Extraction from their Ores, and Applications in the Arts.

2.—Organic Chemistry, comprising Substances found in or derived by Decomposition from Vegetables and Animals; and Physiological Chemistry, both Animal and Vegetable.

The lectures will be illustrated by numerous experiments and specimens; and one hour each week will be devoted to examinations.

Evidently no laboratory work was included in the course.

When the first laboratory was built in 1862, Dr. T. Sterry Hunt, a native of Norwich, Connecticut, and at one time assistant to Professor B. Silliman, Jr., at Yale, was chemist to the Canadian Geological Survey, with headquarters in Montreal. He was appointed professor of applied chemistry and mineralogy (in addition to his work at the Survey), and it was announced that "Practical Instruction in Analytical Chemistry will be given in the Laboratory of the University." This course does not seem to have attracted many students, for, in the Calendar for the

session four years later, it is stated "should students offer, arrangements will be made if possible, for a course in Analytical Chemistry."

Apparently Dr. Hunt's other duties left him less and less time for his college work, as we find this latter dwindled down to a course of lectures on technical chemistry, the Principal, Dr. (afterwards Sir William) Dawson, lecturing on chemistry and agricultural chemistry (as well as on botany, zoology, mineralogy, and geology).

In 1871 Gilbert P. Girdwood, M.D., became professor of chemistry in the Medical Faculty and professor of practical chemistry in the Faculty of Arts. In this same year, Bernard J. Harrington, B.A. (McGill), Ph.D. (Yale), was appointed lecturer in assaying, mining, and chemistry, to become, two years later, a full professor. Too much cannot be said of the devotion which Dr. Harrington showed for his work. For many years he taught all the chemistry, all the mineralogy, all the mining, all the metallurgy, all the petrography that was given in the college. While, of course, no one could be eminent in so many branches, he was a very successful teacher, his students doing most creditable work in after-life, many of them winning positions of distinction both in Canada and in the United States; and he was perhaps the best-loved professor that the college has ever had. It was during his régime as director that the department moved into its new building; and for years afterward he guided, most efficiently, its development.

FOR some years there was a department of practical and applied science in the Faculty of Arts; and in 1878 it was erected into a separate Faculty, that of Applied Science, now the Faculty of Engineering. One of the departments in this Faculty was that of practical chemistry, now chemical engineering. For many years, indeed until the opening of the Chemistry and Mining Building in 1898, laboratory instruction in chemistry was, on account of lack of accommodation, confined almost exclusively to students of this Faculty; only in special cases, and on payment of a special fee, might students of the Faculty of Arts take laboratory courses. Since the opening of the new building, all students in arts (with few exceptions), who take chemistry at all, take the laboratory courses.

Not only did the space allotted to chemistry expand, but the equipment grew and the staff increased accordingly. To the original courses in general and analytical chemistry was first added organic chemistry; in 1894 the first course in physical chemistry was offered by a McGill graduate fresh from Ostwald's laboratory in Leipzig; industrial chemistry, historical chemistry, and colloid chemistry have been introduced,

as well as courses, more or less technical, in various branches of analytical chemistry and chemical engineering.

At the present time the staff of the chemical department includes the director, Dr. F. M. G. Johnson, three full professors, one associate professor, three assistant professors, two lecturers and fifteen demonstrators and assistants, together with store-keeper, laboratory attendants, etc.

In the sixteen undergraduate courses offered today there are registered 866 students; while in the laboratories, which have a total accommodation for 280 students at one time, 521 are doing practical work.

AT THE present time, students entering the faculty of engineering must have completed one year in arts (or its equivalent), including one full course in general chemistry with its laboratory work. During the first year in the engineering school, students in all branches will take a course in elementary physical chemistry. Students entering medicine must have completed three years in arts (or its equivalent) including one full course in general chemistry with laboratory work and one full course in organic chemistry with laboratory work. Afterward, in the medical faculty, they take biochemistry and pathological chemistry.

The graduate school in chemistry has of late years assumed important proportions. Systematic post-graduate instruction really started in 1919. Previous to that year only four Ph.D. degrees had been granted. Since then, and including the session of 1930–31, 60 candidates have obtained this degree, in addition to many who have taken the M.Sc. Up to the present time there has been a steady growth in numbers, but it is feared that these may fall off for a time on account of the existing financial stringency, and the consequent very large decrease in the number of awards for graduate study made by the National Research Council.

The popularity with which this graduate school is regarded in other colleges is witnessed by the fact that over ninety per cent of its students have taken their undergraduate training elsewhere; and of the student scholarships, etc., granted by the Research Council in chemistry, over fifty per cent of the recipients have elected to hold them at McGill. Further growth in numbers can hardly be looked for until new benefactions provide increased space for instruction, the existing accommodations being now taxed to their utmost capacity.

Chemistry in the Glass Industry

By R. A. Miller

The part that chemical science plays in one of the oldest of the arts as seen by the sales manager of the Pittsburgh Plate Glass Company. More chemical knowledge needed.

IN THE development of the glass industry, it is perhaps justifiable to say that mechanical engineering has played a far larger and more important part than any other branch of scientific endeavor. Most of the great and radical developments have been along the lines of increased production by improved mechanical methods. The tremendous increase in quantity production experienced in the bottle industry, the pressed and table-ware division, the incandescent bulb factories, and in plate and window glass, have all been the result of mechanical research; and chemistry has had little or no bearing on the great body of glass involved.

In the past few years the chemistry of metals and alloys has become enormously involved, but the composition of glass has changed hardly at all. Several of the larger glass companies maintain laboratories where the chemistry of glass is being studied quite intensively, and many advances in the art of producing "special" glasses for some scientific purposes have been made. However, the basic composition of the bulk of glass remains what it was in the days of the Romans and the Venetians. Silica, soda, and lime are the present chief constituents.

In ancient days, the alkali used was chiefly potash. The substitution of soda was the result of the quantity production of this material at low cost resulting from the discovery of the LeBlanc and Solvay processes for the manufacture of soda ash. Previous to this time potash from the ashes of the wood used for fuel was recovered and was used in glass. Where seaweed could be had in abundance, soda ash was extracted from this source.

About 1557 the advantage resulting from the use of small percentages of lead oxide to produce brilliant "crystal" glass was discovered in England, but its use did not become extensive until nearly a century later.

The first real work on the production of optical glasses was done by Fraunhofer in Munich, and Guinand in Neufchatel. Later Abbe and

Schott did considerable work in this same field, and the Jena and Bohemian glass of the chemical laboratory of twenty and more years ago was the result of their work. This brings us down to the latter part of the nineteenth and early part of the twentieth centuries. Since the early 1900's, considerable work has been done on the boro-silicate glasses, and for laboratory work Pyrex has almost entirely displaced the soda lime glasses.

Chemistry Beginning to Play a Part

Chemistry is beginning to have a decided bearing upon glass production, but there remains much to be learned. In the analysis of raw materials, chemistry has become indispensable to the large producers, and the check analysis of product is also becoming more and more important. The smaller producers, in many instances, still fail to see the advantages of close control, and few of them employ chemists directly.

Next in importance to the analysis of the raw materials and the product is the analysis of the products of combustion, the characteristics and composition of the fuel, etc. Some glasses require a reducing atmosphere, others an oxidizing atmosphere, and still others a nearly neutral condition. Deficiencies of the flame used may sometimes be compensated for by the composition of the batch, as by the use of sodium or potassium nitrate instead of the carbonate, the addition of extra amounts of coal, etc.

The usual commercial glasses are almost always more or less green in color, due to the ferrous oxide of iron present in the sand used in the batch, or in the clay used for making the melting receptacle. It has been learned that the use of various metallic oxides as oxidizing agents tends to eliminate the green color due to ferrous salts, and since most of these metallic oxides impart characteristic colors, it is frequently possible to mask the colors completely by making them mutually complementary, so that the resulting product is clear and colorless. However, these glasses are not normally transparent to all the various wave lengths of visible light.

Coloring Effect of Metals

Investigations involving the use of metallic elements as coloring agents have been quite extensive. The production of beautiful glasses results from the dispersion of colloidal metals through the glass body. Remarkable ruby glasses are produced by the use of gold or copper; cobalt yields excellent blues; selenium produces ruby glass, while manganese glasses are an intense amethyst in color. The far-famed

CORNER OF PLANT OF PITTSBURGH PLATE GLASS COMPANY

amethyst glass seen in the old homes on Beacon Hill in Boston has resulted from the solarization of ancient glasses originally decolorized by the use of manganese dioxide. There seems to be some evidence, also, that ordinary glasses containing no decolorizer may be made amethystine in color by long exposure to the action of sunlight in desert areas. This change in color is thought to be the liberation of colloidal sodium within the glass body by the action of the ultra-violet rays. However, this whole subject is the basis of considerable controversy at the present time.

Chemical Constitution Still Uncertain

In the analysis of the constitution of glass as such, considerable progress has been made, although no positive conclusions concerning the absolute chemical forms involved have as yet been arrived at. The ternary diagram developed by Gelstharp and Parkinson some years ago has formed the starting point for many similar analyses of glass compositions involving other oxides than those of silicon, sodium, and calcium. It has also formed the basis of many studies involving the physical characteristics of the glasses included in that small portion of the ternary diagram defining the limits of commercial glasses on the basis of transparency, solubility, etc.

Many investigators have devoted themselves to the determination of laws controlling the density, refractivity, etc., resultant from the inclusion of varying quantities of the several "glass making" oxides, but the greater part of this knowledge so gained is rather jealously guarded, and relatively little is to be found in the literature.

The chemistry of glass is still rather meagre in results, perhaps largely because of the difficulty experienced in determining the chemical form of the constituent parts, and the seeming impossibility of arriving at any knowledge of the crystallographic structure. The X-ray has not yet established any definite crystal skeleton in glass. It presents many of the characteristics of super-cooled liquids and amorphous solids.

In the preparation of glass for particular or selective transmission of radiant energy of different wave lengths, chemistry has played a large part, chiefly in the refinement of the oxides by physical analytical methods. Thus, it is well established that ferrous iron in glass will inhibit the passage of ultra-violet radiation in exact proportion to the amount of ferrous iron present. Ferric iron is not so good an inhibitor as is ferrous iron, and to the extent of this difference the inhibition due to iron does not follow in direct proportion to the amount of the element present. Again, it is known that when zinc and nickel are added to a glass otherwise transparent both to visible and ultra-violet radiations, the glass may be rendered almost, if not quite, opaque to the visible light, while the ultra-violet transmission remains unimpaired or even increases.

Optical Characteristics Easily Controlled

In the alteration of the optical characteristics of glass, chemistry has more than demonstrated its ability to produce glasses of almost any desired index of refraction, dispersion, or density. Fusibility and the influence of various constituents upon this characteristic have been quite thoroughly investigated.

In the production of glasses of varying mechanical characteristics, however, very little work has been done, and the influence of various constituents upon tensile strength, compression strength, etc., is all a closed book. In this respect, glass is still in the "Age of Iron" and is just scraping the edges of the "Age of Steel."

Some Obligations of the Scientist*

By Carleton R. Ball

The qualities that make a scientist. Effects on the individual and on the profession.

THIS paper is not theoretical. It is based on a long and varied experience. All that it says comes from a full heart, if not from a ready pen. Most of it has been said at one time or another by other and abler men. And it could say much more. In scope it proceeds from the obligations most intimately related to the work of the scientist to those more closely related to his position as a member of society.

Accuracy

It seems almost absurd to insist that the worker in science should be accurate. One might well say that if a scientist is not accurate he is not truly a scientist. To question his accuracy is like casting doubt on the regularity of earth's rotation or the precession of the equinoxes (whatever that is). Accuracy, however, is more a matter of habit than of ability. Not even all scientists have perfect habits. Of course, not all scientists have been in business quite as long as the earth has been revolving and so may not have had time to get their habits permanently fixed. They must strive mightily to achieve. It is not enough to intend to be accurate. Good intentions often are but paving stones for Hades and other hot places.

Lack of accuracy is evidenced in many ways. It may appear as mis-

* From the *Phi Kappa Phi Journal*.

spelling of the names of persons, or as maddening mistakes in citations of publications. It may be found in misquotations of text. Sometimes it takes the form of a negative statement when the positive was intended, or vice versa. More commonly it occurs as errors in tabulated data, as in additions of totals or in computations of averages.

Whatever the form of the inaccuracy, there can be no doubt of the effects. First, it begets doubt as to the validity of the conclusions. This doubt may cover only the extent to which the error affects the results. The doubt may extend much farther and become a conviction that undetectable errors exist in the paper, and destroy its value. Second, discovered inaccuracies lower the reputation of the writer. Third, published inaccuracies reflect discredit on the institution with which the writer is connected.

Integrity

The scientist, like Caesar's wife, must be above suspicion in matters of ethical or moral standards. His findings must be free from any possible taint of commercial bias. This must be so even if his support be derived in whole or in part from commercial sources. Above all, he must be free from any well-founded suspicion of faking his results. Of all persons, the scientist can least afford to sell his birthright for a mess of pottage. The illustrious Swedish chemist, Berzelius, is quoted by Cohen recently as saying (I spare you the original): "The first and greatest glory of an investigator is his truthfulness and conscientiousness; all his scientific attainments are eclipsed by these qualities."

There has just passed from the stage a tragic figure. On the basis of one-time real achievement and more recent skillfully prepared publicity he has been widely acclaimed as a great leader in one branch of creative science. It is well known among scientists that he has capitalized this reputation successfully to deceive and defraud the public through the sale of faked material. Across the ocean, an international figure in the physical sciences has been dismissed in disgrace from an old and honored university for acts involving moral turpitude. The injury and loss to the individual and his institution are great, but the loss to the reputation of science in the public mind is far greater.

Should the public become convinced that there is wholesale fraud in science, and widespread moral breakdown among scientists, the way of the transgressor may indeed be made hard, but also the way of the honest and true will be made ten times harder. The remedy obviously is education. Dr. Slosson, in one of his "Sermons of a Chemist," says: "The true function of education is the cultivation of the faculty of pre-

vision. . . . You should be able to distinguish between a rising statesman and a false alarm." Speed the day!

Impartiality

At first glance, it may seem that this attribute really is a part of integrity. The distinction may be made clear. Integrity is honesty, moral soundness, rectitude. It implies knowledge of right and wrong, and a conscious or deliberate choice of right. Impartiality is absence of inherent but unconscious bias, prejudice, or favoritism. It is the judicial attitude in contrast to the prejudicial attitude. The scientist must go much farther than the candidate for office who promised, if elected, "not to lean toward partiality on the one hand or toward impartiality on the other."

But what prejudices of a scientist can affect his scientific conclusions, you ask? Well, suppose he were a psychologist making a study of racial or national intelligence. Suppose, further, that he had a strong prejudice against Frenchmen, or Negroes, or Chinese. Unconsciously, he would underrate the achievements of their representatives and so arrive at biased conclusions. Some would urge that, while this bias might be possible in psychology or anthropology, it could never occur in the case of the physical sciences or the larger biological sciences. No man is likely to be prejudiced against chemical elements or particular plants or animals. True, but these are not the only biases. There easily may be a prejudice in favor of a given theory of cause or relation. More subtle still, and also more common, is the bias in favor of one's self or one's own theories, ideas, or accomplishments. The temptation is to strive to see what we wish to see.* * *

Cases are not unknown where men have seized upon a theory as a probability and thereafter have accepted all results favorable to that theory and tended to neglect or ignore all results not in accord with it. Furthermore, they may become so wedded to a hypothesis as to neglect the obvious checks and controls of experimentation.

At the meetings of the American Association for the Advancement of Science a few years ago, a tremendous ovation was given to the young author of a paper apparently marking a striking advance in a new field of biology. The applause lasted for minutes. No such acclaim had greeted any other presentation in biologic science in a half-century. And yet within a few short weeks, a critical study of control material indicated that the supposed new discovery was only a misinterpretation of normal conditions.

Such neglect of check or control studies is not a conscious stultification of the intelligence but an unconscious bias in favor of one idea as against another. It is dangerous because insidious and should be battled vigorously. The scientist, above all others, must represent the league of the open mind. Faraday, the physicist, states the obligation clearly.

> The philosopher should be a man willing to listen to every suggestion, but determined to judge for himself. He should not be biased by appearances; have no favorite hypothesis; be of no school; and in doctrine have no master. He should not be a respecter of persons, but of things. Truth should be his primary object.

Clarity

Clearness in expression is a pearl of great price. It almost may be called the *sine qua non* of writing. It is worthy of long and intense pursuit. Confusion in writing may result from inability to use language skillfully, or from lack of perception of what needs to be told. In the first case it betrays lack of preparation. In the second it indicates a kind of selfishness.

Consider lack of preparation for clear writing. No investigator is willing that another shall write his results. No other should be willing to do so except on terms of joint authorship. Research and writing cannot be dissociated. Therefore the obligation for clarity must be on the investigator. Language is a kit of tools for the expression of ideas. Clarity demands ability to use these tools skillfully. Would you employ a plumber who could pipe your house for water but could not thread the pipes or make the joints water-tight? Not long! Would you pay full wages to a carpenter who could devise a needed cabinet but could not use square or plane or chisel with precision? Not at all. Is the simile too far fetched?

Lack of clarity may arise from the use of unfamiliar terms and similes. It may come about from long and complex sentences in which the effect of modifiers is misplaced. It may be the result of using words which fail to give the exact shade of meaning desired. It may arise from the unrecognized omission of data wholly familiar to the writer but naturally unknown to the reader.

Not long ago a paper discussing a certain organism referred to it as "bun-shaped." If each lady present were to draw a picture of her image of a bun, we should find very wide variation in form. There are definite terms descriptive of every conceivable form. How much better to use the correct term! A recently published paper is of great international

interest because concerned with the important but puzzling virus diseases of plants, possibly comparable to such diseases of humans as yellow fever, spotted fever, sleeping sickness, and others. In this paper certain forms of a supposed causal organism are described as "pumpkin-seed-shaped." To the reader familiar with pumpkin seeds this is clear; to others not. If not, where can one go to learn the shape of a pumpkin seed? Think for a moment also of foreign readers who do not know the pumpkin by its English name, but do know descriptive terms based on Latin roots. How much clearer to have said "broadly elliptical" or "narrowly obovate," or whatsoever was accurately descriptive.

A cynic has said that language was given man to enable him to conceal his thoughts. Sometimes it appears as if the cynic were right. Dare I ask the members of this distinguished company if they have had recent experience in being unable to find the meaning of an author by what he wrote? The prayer of the Scottish poet: "O wad some power the giftie gie us, tae see oursels as ithers see us" might well be the daily petition of every scientist who speaks or writes.

In our capital city and elsewhere laws provide severe penalties for persons whose automobiles carry any device for producing a smoke screen. Is legislation needed to penalize such devices on fountain pens or typewriters?

Scholarship

By scholarship I mean not so much rank of achievement as studiousness. Senator Woodbridge N. Ferris, of Michigan, is founder of the famed Ferris Institute. He devotes most of his time to education when he is not senating. In a recent address he said that when a man has ceased to study he is dead. The Senator added that a lot of persons in that condition do not know they are dead, and so insist on hanging around and getting in the way of the live ones.

None can question the obligation of the scientist to pursue studies so long as he shall live. He is not like the small-town youth who went into the city to read law with a great jurist. After a week he returned to his own community. On being asked how he liked law, he replied, "Tain't what it's cracked up to be. I'm sorry I learnt it." We have it, on the word of many educators, that the sciences are not cultural subjects. We would not start an unseemly argument with our pedagogic betters. Rather would we declare that, as the arts should know more science, so the sciences should know more of language, literature, history, and art.

There also is upon the scientist an obligation to encourage habits of study in others, especially his younger associates. Like accuracy, study-

ing is much a matter of habit. Example and encouragement go far. The ultimate effect is great. There are no royal roads and few short cuts. Application, industrious and long-continued, is what counts.

Publicity

The scientist ought to be human. Usually he is. In the popular conception, however, he is a weird creature characterized by long whiskers and long words. He delves into abstruse mysteries and shuns his fellows. We know better, but much of the public does not. If the scientist needs more appreciation as a member of the human family, obviously he should strive to be more broadly human in his sympathies and interests. Thus will he best serve his science and himself.

True science needs more legitimate advertising to the people. She needs to sell her wares in the public market as well as on the stock exchange. She needs to be known and loved by the man at the desk, the man at the machine, and the man in the street. The present Secretary of Agriculture, whose membership with us we prize and whose absence tonight we regret, coined an apt phrase at the beginning of his official career. He said that the farmer's need was to become articulate. Science has urgent need to become articulate in popular speech.

Science, however, has not been without her apostles. There always have been those who have stirred the imagination of the people. In our own times, Slosson made chemistry speak in the language of the day. But one man, at best, is but a voice crying in the wilderness. And the wilderness is very, very big, and, by comparison, the voice is very, very small. Multiply one voice by the total number of the devotees of science and the story can be told to the whole world.

Science is receiving great subsidies. She has need of greater, that the scientist may enter upon greater labors, and produce greater and more universal results. Of funds there is no lack. Money is being poured out by billions on those objects which most interest the possessors. Let scientists but make their discoveries of absorbing interest and the billions shall be theirs. The challenge is clear, the opportunity unrivaled, the obligation paramount.

Conclusion

The scientist is slowly unraveling the tangled and broken threads that were the warp and woof of the fabric of our past. He is helping to brighten and to broaden present-day life in a thousand definite but often unrealized ways. He is working behind the scenes with the Creator for a

still more glorious future. He thus stands before the world as the interpreter of what has been, the worker of the myriad miracles that are, and the prophet of undreamed things to come. With high ideals he shall labor, and from balanced judgments he shall speak in clear and simple words the marvelous truths of nature and of God.

Little Enzymes

By Cosmic Ray

One thing we have always wanted to see, but never have, is a phrenologist picking out a June cantaloupe.

Lodge says that "life is something that crystallizes from the ether." But not by reducing the temperature.

A local research chemist examined a dog's lungs under a microscope but failed to find the seat of his pants. (Maybe the chemist was befuddled. Since prohibition no one can tell what's indican, and even the oils are cracked.)

Steel wool, contrary to popular opinion, does not come from the sheep on the Iron Mountains—nor is silver nitrate the cost of long-distance telephone calls after 11 o'clock.

But a sailor's twins might be double-salts.

Marriage to many a maid is a solution. A colloidal gold solution.

They tell us the average man lugs around 24 pounds of carbon in his body. No wonder some people always have a knock.

The Situation in Buffalo

By John F. Williams

EFFORTS to create a chapter of The American Institute of Chemists in Buffalo have been made in the past. One was initiated by the late Roger Williams, whose unfortunate death in 1929 terminated the work for the time being. Robert J. Moore made a similar effort; but unfortunately for Buffalo chemists, he was called to pursue his scientific work in New Jersey.

An intra-industry group was started, but the movement was discouraged by the then-prevailing attitude of the management of the particular industry. Now an inter-industry group has begun under the heading of the Buffalo Chemists' Club, which meets each Saturday for luncheon at the Touraine Hotel. This group proposes for the coming year to have an informal talk by one of its own members, or occasionally by an outsider, on a scientific or other topic of interest to chemists. The group was started last year by the efforts of Dr. Howard W. Post, and now under the leadership of Mr. William Cotton looks forward to a successful year. Both men are Fellows of The American Institute of Chemists.

THE Niagara Falls chemists have for years maintained a luncheon club under the designation of "Electrons," whose chairman is entitled the "Nucleus." They meet each Wednesday noon at the Hotel Niagara. Although the meetings are entirely informal, some excellent talks are given. This group has been highly successful both in attendance and in the advantages gained from personal contact and sociability.

The Buffalo Chemists' Club expects to gain the advantages realized by the Falls organization, but with the further idea of having a definite plan or object for the future. It is believed this group, most of whose members have ideas coincident with those of the A. I. C., may eventually become a chapter of the professional organization. This possibility strengthens the hope of those chemists in Buffalo who realize the need of a strong professional organization to further the advancement of chemistry as a profession as well as the legal status of chemists. The local activities have taken on the aspects of a pioneer movement.

Members of the American Chemical Society in Buffalo belong to the Western New York Section, which embraces both Niagara Falls and Buffalo. The membership is divided nearly equally between the two industrial centers, and meetings are held alternately in Buffalo and Ni-

agara Falls. Cooperation between the members of the American Chemical Society and the Buffalo Chemists' Club may easily be brought about.

FOR the technical side of the Buffalo chemist, chemical literature is found in the reference rooms of the Grosvenor Library. The library at the University of Buffalo and the one at the National Aniline and Chemical Company plant on Abbott Road, as well as the libraries of other industrial plants, have also been placed at the disposal of chemists. Within the last few years a survey of chemical publications available to chemists was made by the Western New York Section of the A. C. S. A list of these publications was printed in the Section Bulletin, *The Double Bond*, March, 1928.

Another matter of interest to chemists here is the newly established Jacob F. Schoellkopf medal. This recognition is given annually to the chemist who makes the greatest contribution to the science in this area. Nominations are received from industrial plants, institutions, or individuals; and a jury composed of the present chairman and four past chairmen of the Western New York Section makes the award.

No work has been done here by any group for the relief of unemployment among chemists so far as the writer has been able to learn. There is needed at present a survey to determine the extent of the unemployment situation; and an outline of how this problem has been handled in other cities would be of great value.

Civil Service Examination

THE United States Civil Service Commission announces the following-named open competitive examination:

ASSISTANT ASSAYER

Applications for the position of assistant assayer must be on file with the U. S. Civil Service Commission at Washington, D. C., not later than October 27, 1932.

The examination is to fill a vacancy in the United States Mint, New Orleans, La., and one in the Assay Office, Helena, Mont., and vacancies occurring throughout the United States in positions requiring similar qualifications.

The entrance salary is $2000 a year, less a furlough deduction of $8\frac{1}{3}$ per cent and retirement deduction of $3\frac{1}{2}$ per cent.

Competitors will not be required to report for examination at any place, but will be rated on their education, training, and experience.

Applicants must have had certain specified education, and certain specified experience in assaying gold, silver, or other precious metals.

Full information may be obtained from the Secretary of the United States Civil Service Board of Examiners at the post-office or custom-house in any city, or from the United States Civil Service Commission, Washington, D. C.

BOOK REVIEWS

An Introductory Course in Physical Chemistry. By WORTH HUFF RODEBUSH. *D. Van Nostrand.* $3.75.

In view of his background of many years' experience in teaching physical chemistry, one would naturally expect that Professor Rodebush could produce a good textbook on the subject. The book at hand is excellent in its extensive and intensive covering of the field and in its independence from higher mathematics—although this independence must be qualified by the minimum of calculus which is indispensable to any course in physical chemistry.

In a publisher's foreword the student user of the text is advised to "retain it for your reference library. You will use it many times in the future." This advice is sound. A brief index and the topical form of statement make the book valuable as a general reference. On the other hand, the form of statement (having almost the quality of a lecturer's notes) seems to require full development by the lecturer for the student's ready comprehension of the subject matter.

KARL M. HERSTEIN

Microchemical Laboratory Manual. By FRIEDRICH EMICH, with a section on spot analysis by F. Feigl. Translated by F. Schneider. *John Wiley and Sons, Inc.* $3.00.

The microscope has been a tool of the investigator for many years; and bacteriologists, biologists, and mineralogists have developed separate techniques for use in their particular fields. The chemist as a rule has rather neglected this valuable tool or has assigned its use to those branches of chemistry similar to the above sciences. Chamot was and is a pioneer in this country in the application of the microscope to problems in analytical chemistry which often are insoluble by other means. In the last two decades there has also grown up in Germany, led by the work of Pragl, a technique of quantitative elementary analysis of organic substances.

The laboratory manual before us represents a digest of the voluminous literature on qualitative and quantitative chemical analysis by the new methods using quantities 100 or 1000 times less than formerly were required. Whoever takes the trouble to acquire the physical

equipment and the skill to perform the experiments laid out in this manual will find himself prepared to attack new fields of work or to carry out many of his customary tasks by methods whose elegance and economy of both material and time leave nothing to be desired.

In excellence of translation, make-up, indices, lists of apparatus, and references the manual is to be recommended.

KARL M. HERSTEIN

OUR AUTHORS

Future of the Institute

Leonard Wickenden, F.A.I.C., is the inventor of the decolorizing carbon, "Suchar," and is vice-president of the Suchar Process Corporation. He is co-patentee of furnaces for manufacturing or reactivating decolorizing carbons. Other work has been on methods of refining sugar and of manufacturing invertase.

He was educated at the Central Technical College of the City and Guilds of London and was at one time chief chemist of the New York Laboratories of the West Virginia Pulp and Paper Company.

Mr. Wickenden likes tennis, swimming, and fishing. He is a member of The Chemists' Club, the American Chemical Society, the Society of Chemical Industry, and the American Association for the Advancement of Science.

Pure Food Chemist

P. B. Dunbar, assistant chief of the United States Food and Drug Administration, was graduated from Gettysburg in 1904 and went on to Johns Hopkins for his Ph.D. He entered the Bureau of Chemistry under Dr. Wiley in 1907, immediately after the Food and Drugs Act became effective. He was engaged in chemical work, particularly food analyses and the development of analytical methods for detecting adulteration. In 1925 he was appointed assistant chief of the Bureau of Chemistry in charge of law enforcement work, and was transferred to the Food and Drug Administration in 1927, when that administration was formed.

Mr. Dunbar is a member of the American Chemical Society and of the Association of Official American Agricultural Chemists.

Biographer

Horace G. Byers, F.A.I.C., went to Westminster as an undergraduate, continued his studies at Johns Hopkins, Chicago, Leipsic. After receiving his Ph.D. from Hopkins he became professor of chemistry at the University of Washington, where he stayed twenty years. After nine additional years in teaching, as a professor at Cooper Union, he entered the government service. He is now chief of the Division of Soil Chemistry and Physics. This contact with the new president of the Institute, and his early observations as Dr. Knight's teacher, make him a fitting biographer.

Dr. Byers was himself the first president of the Institute (1923–24). He holds an honorary LL.D. from Westminster College; and he is a member of the American Chemical Society and the American Association for the Advancement of Science.

Report from Buffalo

John Francis Williams, F.A.I.C., was graduated from North Carolina State in 1917. After one year in industry he entered the government service and is now in charge of the Buffalo laboratory of the U. S. Bureau of Industrial Alcohol. He is the author of papers on the analysis of alcoholic liquors and on narcotics.

Mr. Williams is chairman of the Western New York Section of the American Chemical Society.

Paper Chemist

Robert Howard Stevens, F.A.I.C., had varied experience before he reached his position as chief chemist of the Bogalusa Paper Company. After receiving his master's degree from the University of Chicago, he spent several years doing graduate work at Illinois, then became a rancher in South America. Returning to the chemical industry, he worked with insecticides in Florida, then spent five years as a consulting engineer in New York, and finally settled upon the paper industry.

Robust, middled-aged, Mr. Stevens is a hard worker. One of his chemical developments is a new sizing agent for paper. As a result

of his work in South America, he speaks Spanish fluently, and includes among his memberships the Sociedad Española de Fisica y Quimica.

Alcohol Control

Carl A. Nowak, F.A.I.C., was graduated from the University of Chicago in 1910 with honors. After three years as instructor in physics and chemistry at the Wahl-Henius Institute, he entered the brewing industry and became chemical superintendent of William Rahr Sons. For the past fifteen years he has been director of the Nowak Chemical Laboratories, a consulting and research organization with headquarters in St. Louis.

The author of four books on brewing, Mr. Nowak is editor and publisher of *The Brewer's Art*, a bi-monthly magazine. He is a member of the American Chemical Society and of the American Association for the Advancement of Science; and he is a Fellow of the Royal Society as well as of The American Institute of Chemists.

Chemical Interview

Frederick D. Crane, F.A.I.C., is one of the charter members of the Institute. Formerly located in Montclair, N. J., he has been abroad since 1930.

Defends American Chemists

Francis P. Garvan is never so happy as when he is defending from foreign attacks the industry he created. Most of the present preeminence of American chemistry is due to his efforts; and he is determined to keep the country in such a position that it can never again be subjected to national danger because of the lack of essential chemical products.

The Garvan philanthropies have extended into other fields as well as chemistry—education, medicine, biology, history, and physics. He has recently made valuable contributions of early Americana to various museums and to Yale.

Unemployment Committee

Robert L. Holliday, Princeton '05, was chief engineer for the General Chemical Company and the Spray Drying Process Corporation, and was also design engineer for Du Pont, before he went into business as a consulting chemical engineer. He is the inventor of spray-dried soap—"Super Suds."

Healthy, athletic, tireless, Mr. Holliday is known among his colleagues for his ability to direct work and establish esprit de corps. His favorite hobby is golf and his other hobby is stamp collecting. He is a member of the American Institute of Chemical Engineers and of the Sons of the Revolution.

Canadian Educator

Nevil Norton Evans, a professor whose special ability is teaching elementary chemistry, studied at the Royal Saxon School of Mines at Freiberg under Winkler, also studied at Leipsic under Ostwald. Now professor of chemistry at McGill, he formerly taught at McGill Normal School and Montreal High School. He is a member of Sigma Xi.

Dr. Evans' society memberships include: Canadian Institute of Chemistry and the Society of Chemical Industry. He is a member of the University Club of Montreal and of the Whitlock Golf Club.

New Glass Developments

Robert A. Miller is a Yale man who continued his studies at the Massachusetts Institute of Technology. Most of his industrial experience has been in the glass industry. He holds several patents, and is now assistant superintendent and technical sales engineer of the Pittsburgh Plate Glass Company.

Obligations of a Scientist

Carleton R. Ball, of the University of California, has a broad viewpoint as regards the government attitude toward agriculture and natural resources. He is deeply interested in the question of governmental relations to the human life in business, and he tries to find out where we now stand in these matters and where we may presumably go in the future.

Social and companionable, Dr. Ball is particularly fond of his family and friends, particularly objects to social injustice and narrow prejudices. He is a former president of the American Society of Agronomy, and is now president of Gamma Sigma Delta, the national agricultural honor society.

INSTITUTE NOTES

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National Council

The ninety-third meeting of the Council of The American Institute of Chemists was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on Wednesday, August 24, 1932. President Henry G. Knight presided.

The following councilors and officers were present:

Messrs. Arnstein, Breithut, Brooks, Crossley, Jackson, Morgan, Neiman, Sachs, Zons. Mr. Edward L. Gordy, editor of THE CHEMIST, was also present.

Upon motion made and seconded it was decided that the number of pages in THE CHEMIST be reduced from 96 to 80.

Upon motion made and seconded it was decided that the roster of the Institute be the September issue of THE CHEMIST.

Upon motion made and seconded it was:

RESOLVED, That 2000 application blanks be printed.

Upon motion made and seconded it was:

RESOLVED, That 2000 issues of the September CHEMIST be printed.

The question of group insurance for chemists was discussed; and upon motion made and seconded the following Committee to investigate the subject was appointed by the President:

Committee on Group Insurance: Dr. M. L. Crossley, Chairman; Dr. B. T. Brooks; Dr. D. P. Morgan.

The Secretary presented a letter from The Chemical Foundation relative to its financial assistance to the Institute; and the question of finances of the Institute was discussed in detail.

The ninety-fourth meeting of the Council of The American Institute of Chemists was held at The Chemists' Club, 52 East 41st Street, New York, N. Y., on Thursday, September 8, 1932. President Henry G. Knight presided.

The following councilors and officers were present:

Messrs. Arnstein, Breyer, Brooks, Crossley, Jackson, Knight, Neiman, Sachs, Zons. Mr. Edward L. Gordy, editor of THE CHEMIST, was also present.

President Knight reported on the conferences he had had with Mr. Buffum of The Chemical Foundation, in which Mr. Buffum emphasized the opinion that by proper effort the Institute might increase its membership by April 30, 1933, to a point where it would be self-supporting. The subject of the future of the Institute was discussed at great length; and it was the consensus of the councilors present that the first essential was an increase in membership. Means for accomplishing this were presented to the membership committee.

Upon motion made and seconded $350.00 was appropriated to the membership committee, to be applied by it to a campaign for the increase of members.

The Secretary reported that the amendments to the Constitution presented at the last annual meeting had been adopted by the membership by a vote of 205 to 6.

It was decided that the annual dues of members should be as follows: Fellows—$10.00, Associates—$3.00, Juniors—$2.00, Student Members—$2.00.

HOWARD S. NEIMAN, *Secretary*

Applications for Membership

FELLOWS

AUGUST MERZ, *Vice-president*, Calco Chemical Company, Bound Brook, N. J.

WILLIAM DEGARMO TURNER, *Assistant Professor*, Columbia University, New York, N. Y.

BYRON L. WEST, *Research Chemist*, Calco Chemical Company, Bound Brook, N. J.

LINCOLN T. WORK, *Assistant Professor*, Columbia University, New York, N. Y.

NEWS

At Denver

William Foster, F.A.I.C., professor of chemistry at Princeton, read a paper on "Chemistry and Grecian Archeology."

Donald B. Keyes, F.A.I.C., professor of industrial chemistry at Illinois, read a paper on "Esterification Processes and Equipment."

Carleton Ellis, F.A.I.C., addressed the Division of Paint and Varnish Chemistry on "New Developments in Organic Chemistry, with Their Possible Application to Coating Materials."

F. W. Zerban, F.A.I.C., and **C. A. Gamble** presented a paper on "The Effect of Reversion Products and of Amino Compounds on Sucrose Determinations in Cane Products."

Fraud Exposed

The recent decision for the government in the case brought by the U. S. Food and Drug Administration against "B. & M." liniment is expected to have far-reaching effects in the application of the Food and Drugs Act to proprietary drug products.

The government alleged that this water, turpentine, ammonia, and egg liniment, sold as a remedy for such diseases as tuberculosis, influenza, pneumonia, and swellings, was falsely and fraudulently labeled. In a previous trial in 1922, the government had unsucessfully made practically the same charge. At that time the manufacturer produced many lay witnesses who testified that they had been cured of various diseases by the use of "B. & M."

The government, in the present case, presented the testimony of leading doctors, who testified that "B. & M." is without curative or therapeutic value in practically all of the diseases for which it is recommended.

David L. Martin, medical adviser to the E. E. Rollins Company, testified for the claimant that he had used "B. & M." successfully in the treatment of most of the diseases mentioned in their labeling. The claimant also produced lay witnesses who claimed they were cured of the various diseases referred to. Among these were two men who testified to recovery from pulmonary tuberculosis after using "B. & M." Dr. Samuel Wolman testified that he examined these witnesses after they had testified and found them in an advanced stage of pulmonary tuberculosis.

German Unemployment

According to the latest statistics of the *Verein Deutscher Chemiker*, the number of German chemists in the profession in 1932 is estimated to be 11,200, as compared with 12,500 in 1928. Their distribution is given in the following table:

Type of Work	*1928*	*1932*
Chemical industry	5500	4700
Other branches of industry	4500	4100
Total number active in industry	10,000	8800
Official laboratories	500	400
Teaching and other official positions	1500	1400
Foreign countries	500	600

Since the academic year 1919–20, 7300 young chemists have concluded their study at the hochschules. With a loss of 400 chemists annually by death or retirement, the active demand for young men during the past thirteen years amounts to 5200 persons, leaving an excess of 2100 young chemists. On the assumption that a third of this number have turned to other callings, about 1500 young chemists await employment, and with 1200 older chemists who are without positions, there are at present 3000 unemployed German chemists.—*Industrial and Engineering Chemistry*

D. D. Jackson, F.A.I.C., and **Irving Hochstadter**, F.A.I.C., have returned from a six weeks' business and pleasure trip in Europe.

Alcan Hirsch, F.A.I.C., sailed for Russia on the *Bremen* on Friday, September 29th, to resume his duties as chief consultant to the chemical industries of the U.S.S.R.

Kenney Wins Cup

The fall golf tournament of The Chemists' Club was held on Wednesday,

September 21st, at the Pelham Country Club, with 73 members and guests competing. The players found Pelham more difficult than the Rye course used in the spring tournament but turned in some creditable scores.

The President's Cup, awarded for the low net score for the year, was won by Frederick Kenney, chief chemist of the Department of Purchase Laboratories of New York City. The 64 he made in the June tournament gave him a six-stroke starting advantage over Elon H. Hooker, his nearest rival, and enabled him to win without being in serious danger.

Other prize-winners were:

LOW GROSS

Glenn L. Haskell, U. S. Industrial Alcohol Company	83
A. B. Baker, Bradley & Baker	85
J. P. Hubbell, Singmaster & Breyer	90

LOW NET

Frank G. Breyer, F.A.I.C., Singmaster & Breyer	103–25—78
R. H. Funke	112–33—79

KICKERS' HANDICAP

H. B. Prior, H. B. Prior Company	98–18—80

GUEST PRIZE

H. R. Wemple, Texas Gulf Sulphur Company	80–5 —75

George C. Lewis, president of the club, acted as toastmaster at the dinner. The principal speech of the evening was delivered by Harry Mabey; and a paper was read by Leon V. Quigley, F.A.I.C., on "I. The Phospholipoid-cholesterol Ratio in Pigeon's Blood. II. The Aqueous Pyridine Extract of the Anterior Pituitary Hormone."

Talks in a lighter vein were made by H. O. Chute and by John Chew, who substituted for Ralph Dorland. After

songs by the glee club, under the leadership of Frank G. Breyer, the prizes were presented by R. J. Quinn, of Mathieson

Alkali, who is in charge of the golf activities of the entertainment committee of The Chemists' Club.

Removing Mercurochrome

As with other excellent antiseptics of the coal-tar dyes, such as auramine and acriflavine, the staining properties of mercurochrome are a distinct disadvantage. However, these stains may be counteracted by subsequent painting with 2 per cent potassium permanganate followed by 5 per cent oxalic acid.

—*The Manufacturing Chemist*

A meeting of the American Oil Chemists' Society will be held at the Congress Hotel in Chicago, October 20th and 21st.

Florence E. Wall, F.A.I.C., cosmetic expert, is to be director of the educational program of the American Beauty and Styles Exposition at the Grand Central Palace, October 17th–20th. This is the first time any organized attempt has been made in a trade show to educate the public on the mysteries of beautistry.

Calm M. Hoke, F.A.I.C., is the author of a new booklet, *Testing Precious Metals with the Touchstone.*

Ferdinand F. E. Kopecky, A.A.I.C., has joined the staff of the Ellis Laboratories, Montclair, N. J.

J. W. H. Randall, F.A.I.C., is recovering from an operation for appendicitis.

Ralph Wechsler, F.A.I.C., technical director of the National Oil Products Company, Harrison, N. J., has sailed for Europe on business.

Carleton Ellis, F.A.I.C., has returned from a combined business and pleasure trip to Europe.

Alan Porter Lee, F.A.I.C., has returned from a business trip to Havana.

R. V. Townend is spending the year in advanced study in Berlin.

Frederick Kenney, F.A.I.C., has returned from a vacation in Europe.

Club Entertainment

The entertainment committee of The Chemists' Club, under the chairmanship of Howard Farkas, has announced a duplicate bridge tournament to be held on the first Wednesdays in October, November, and December. Guests are invited. Top score cups will be awarded the winners in each session; and in addition the President's Cup will be awarded for the best season's play.

Registration for the first session does not obligate players for future sessions. The playing fee is $1.00 per evening.

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